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RUUD AUTOMATIC
GAS WATER HEATERS

RUID AUTOMATIC
GAS WATER HEATERS

AUG 25 '28

RUUD AUTOMATIC GAS WATER HEATERS



1889-1890

First Ruud Automatic Water
Heater Built



1897

The Present Company Organized
and Incorporated



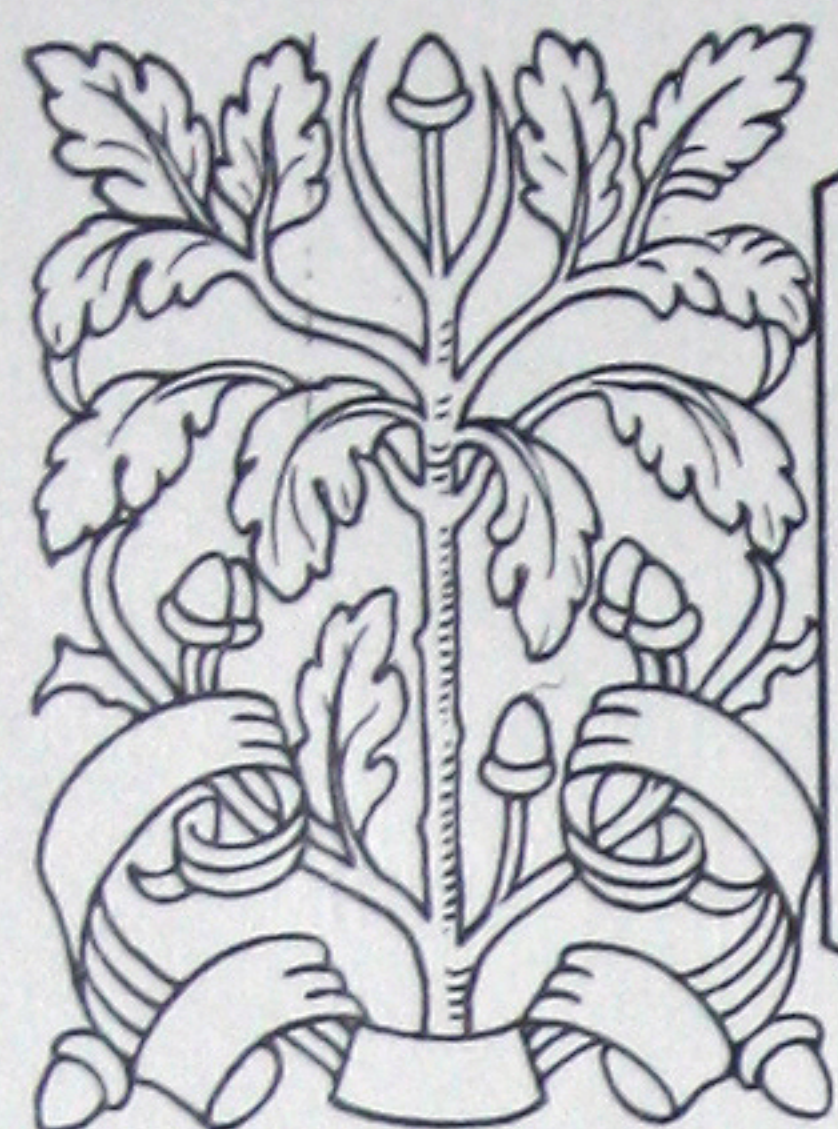
1925-1926

Nearly Forty Years of Mechanical
and Commercial Success

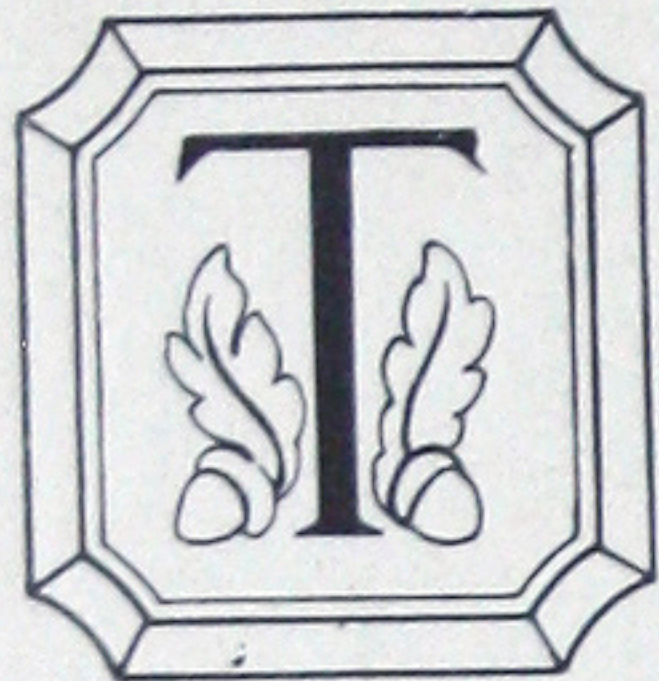
RUUD MANUFACTURING COMPANY, PITTSBURGH, PA.

RUUD MANUFACTURING COMPANY - - TORONTO, CANADA

Branch Offices in all of the Large Cities



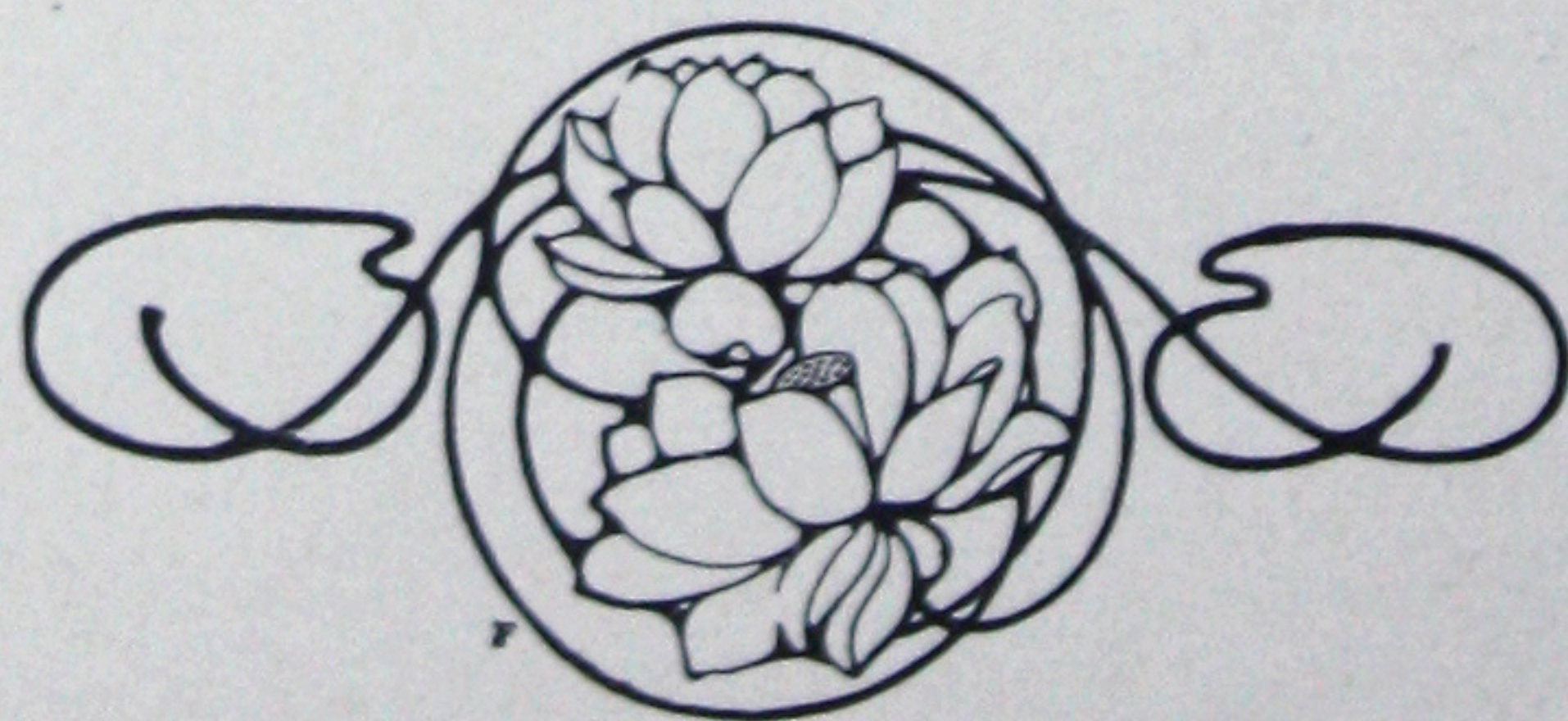
FOREWORD

HE purchaser of an Automatic Gas Water Heater must rely on the dealer for instruction and assistance in the selection, installation and operation of the appliance, if satisfactory and lasting hot water service is to be assured.

The description, on the following pages, of the different types and sizes making up the complete RUUD Line, together with the discussions of their applications to usual every-day hot water requirements, is intended to be of real service to those concerned in placing the product in the hands of the user.

The story of the beginning, the development and the success of Automatic Hot Water Service is also the history of this Company, from its beginning in 1889 to the present time.

Over a third of a century's growth and experience suggests stability and permanence. Age alone, however, is not so important as the thing which made that age possible—a product which has been fundamentally correct from the very beginning and which is the cornerstone of our acknowledged position as leader in the Gas Water Heater Industry.





160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60°

SEATTLE
PORTLAND
SACRAMENTO
OAKLAND
SAN FRANCISCO
FRESNO
PASADENA
LOS ANGELES
SAN DIEGO
DENVER
DULUTH
ST. PAUL
MINNEAPOLIS
MILWAUKEE
CEDAR RAPIDS
ROCKFORD
CHICAGO
JACKSON
DETROIT
TORONTO
STRAUSE
ALBANY
SPRINGFIELD
HARTFORD
BOSTON
WORCESTER
BROCKTON
PROVIDENCE
NEW HAVEN
NEW YORK
EAST ORANGE
NEWARK
PHILADELPHIA
HARRISBURG
PITTSBURGH
CLEVELAND
TOLEDO
INDIANAPOLIS
DAYTON
CINCINNATI
LOUISVILLE
ST. LOUIS
SPRINGFIELD
KANSAS CITY
ATLANTIC CITY
BROOKLYN
BALTIMORE
WASHINGTON
BIRMINGHAM
ATLANTA
JACKSONVILLE
NEW ORLEANS
HOUSTON
SAN ANTONIO
FT. WORTH
DALLAS
OKLAHOMA CITY

160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60°

Longitude West 90° From Greenwich.

40° 30° 20° 10° 0° 10° 20° 30° 40°

Latitude North 90° From Greenwich.

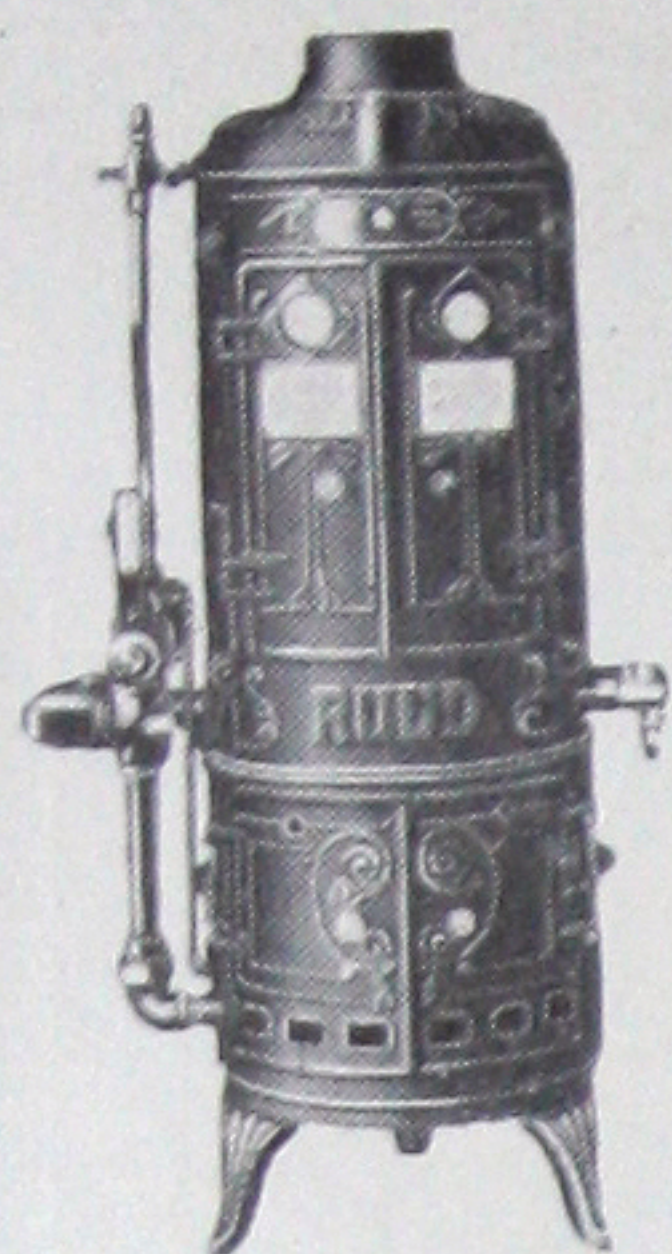
OUTLINE MAP OF THE
UNITED STATES.

SCALE OF STATUTE MILES
0 100 200 300 400 500 600 700 800 900 1000

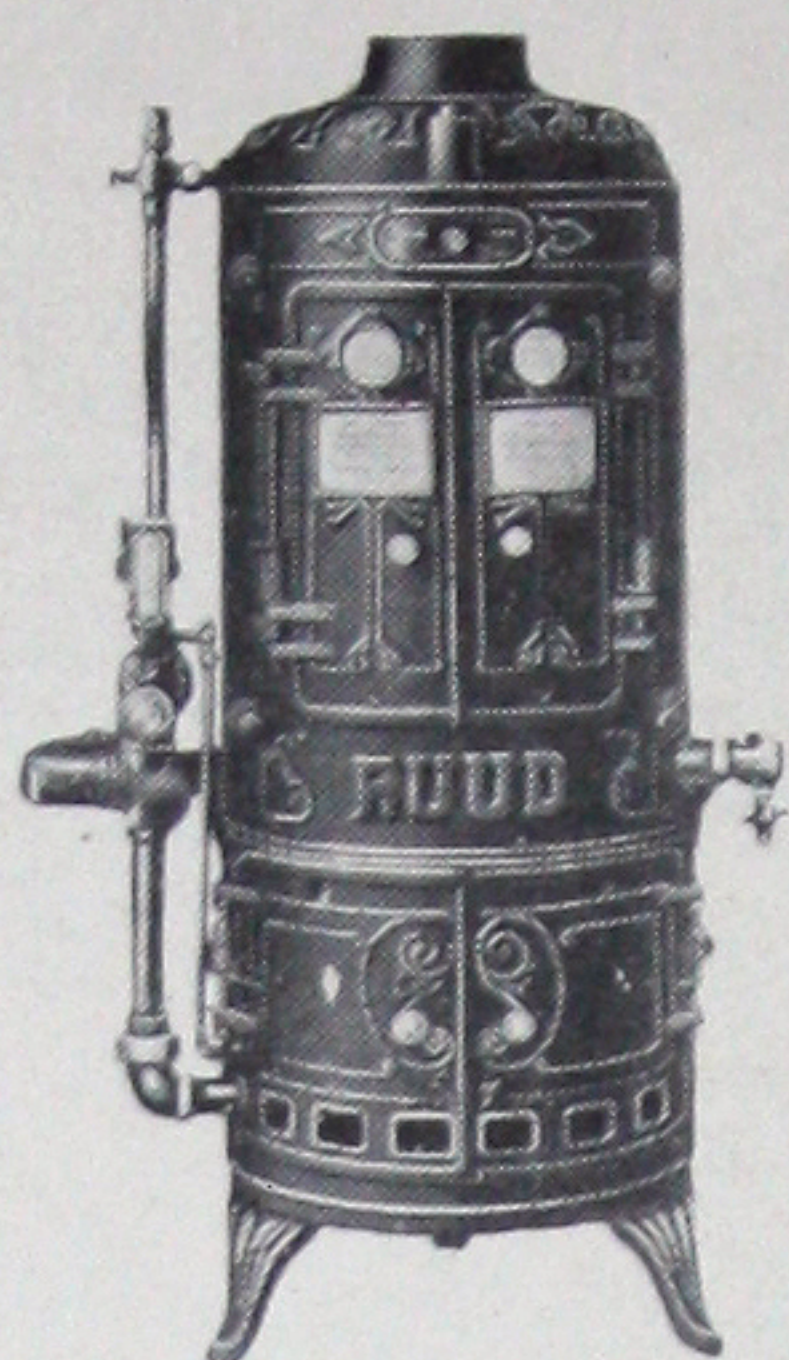
Oakland, Calif.....	2-3-4
Oklahoma City, Okla....	2-3-4-5
Pasadena, Calif.....	2-3-4
Philadelphia, Pa.....	2-3-4-5
Pittsburgh, Pa.....	1-2-3-4-5
Portland, Ore.....	2-3-4-5
Portland, Me.....	2
Providence, R. I.....	2
Rockford, Ill.....	2
San Diego, Calif.....	2-3-4
San Francisco, Calif....	2-3-4-5
Sacramento, Calif.....	2
San Antonio, Tex.....	2-3-4-5
Springfield, Mass.....	2
Springfield, Ill.....	2
St. Paul, Minn.....	2-3-4
St. Louis, Mo.....	2-3-4-5
Seattle, Wash.....	2-4
Syracuse, N. Y.....	2-3-4-5
Toledo, O.....	2-3-4-5
Toronto, Ont.....	1-2-3-4-5
Washington, D. C.....	2-3-4-5
Worcester, Mass.....	2

RUUD MANUFACTURING COMPANY, Pittsburgh, Pa.
RUUD MANUFACTURING COMPANY, Toronto, Ont.

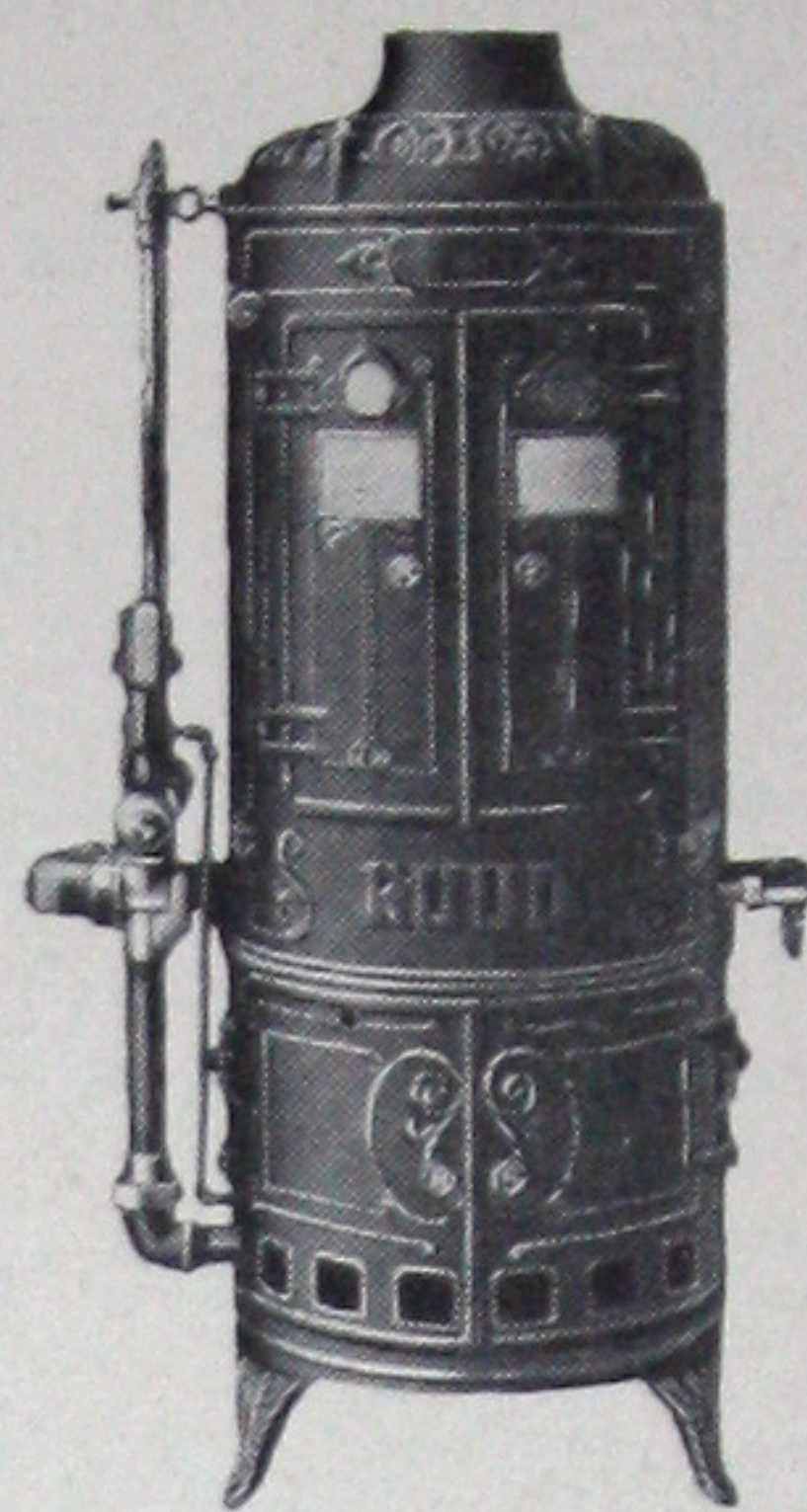
1D 90-B6233 TCF



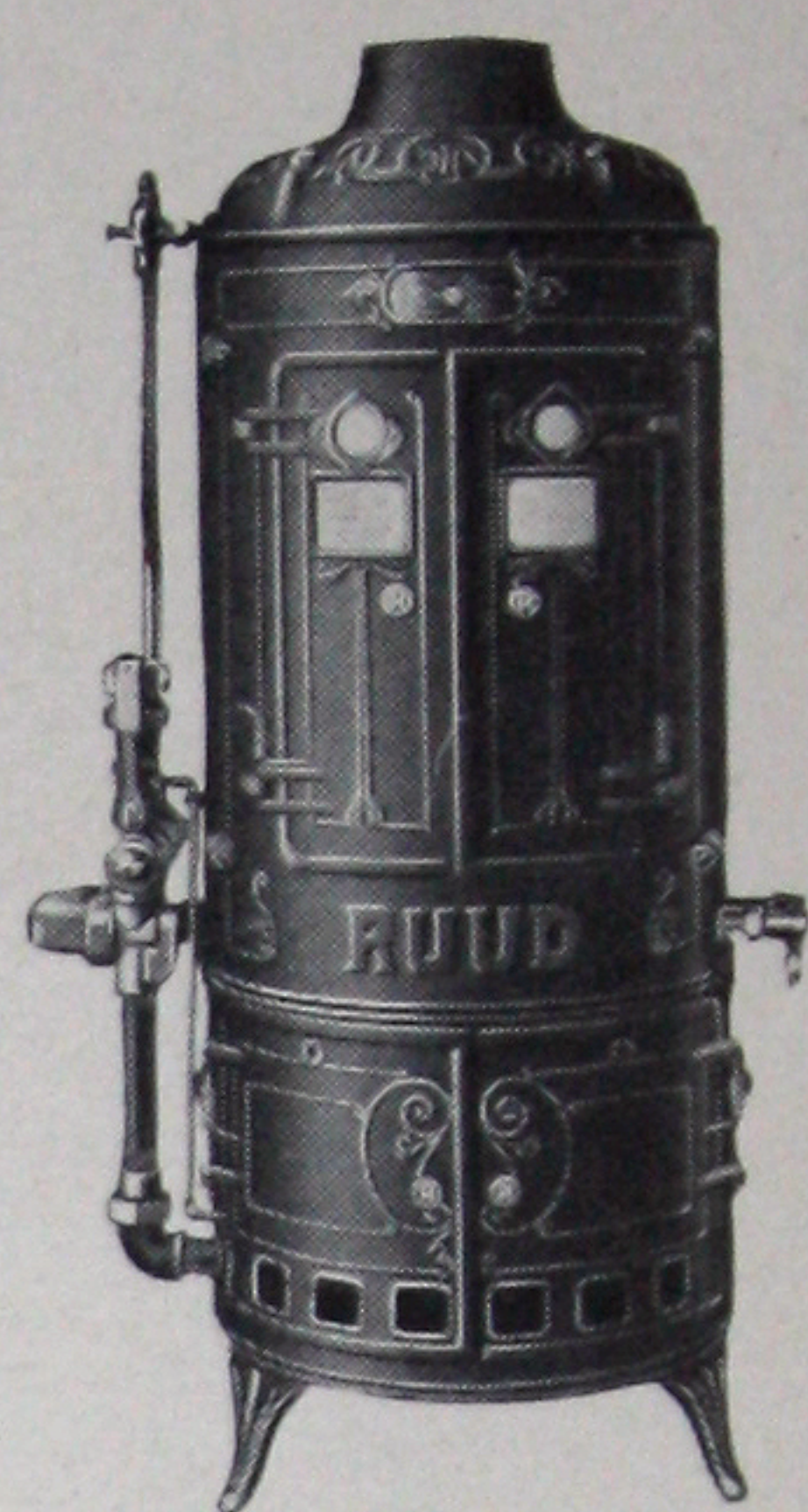
No. 3



No. 4



No. 6



No. 8

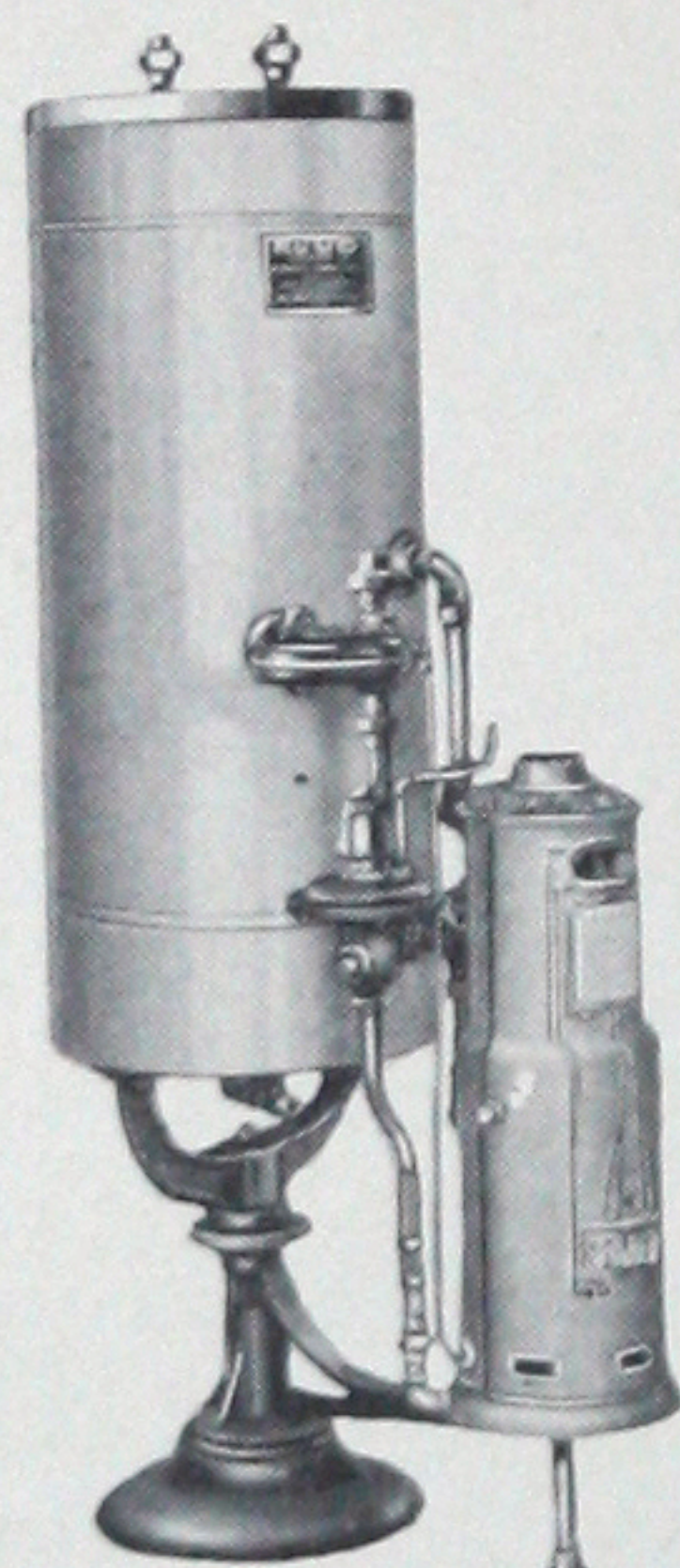
Ruud Automatic Gas Water Heaters, Instantaneous Type
Four Sizes—see pages 6 to 13



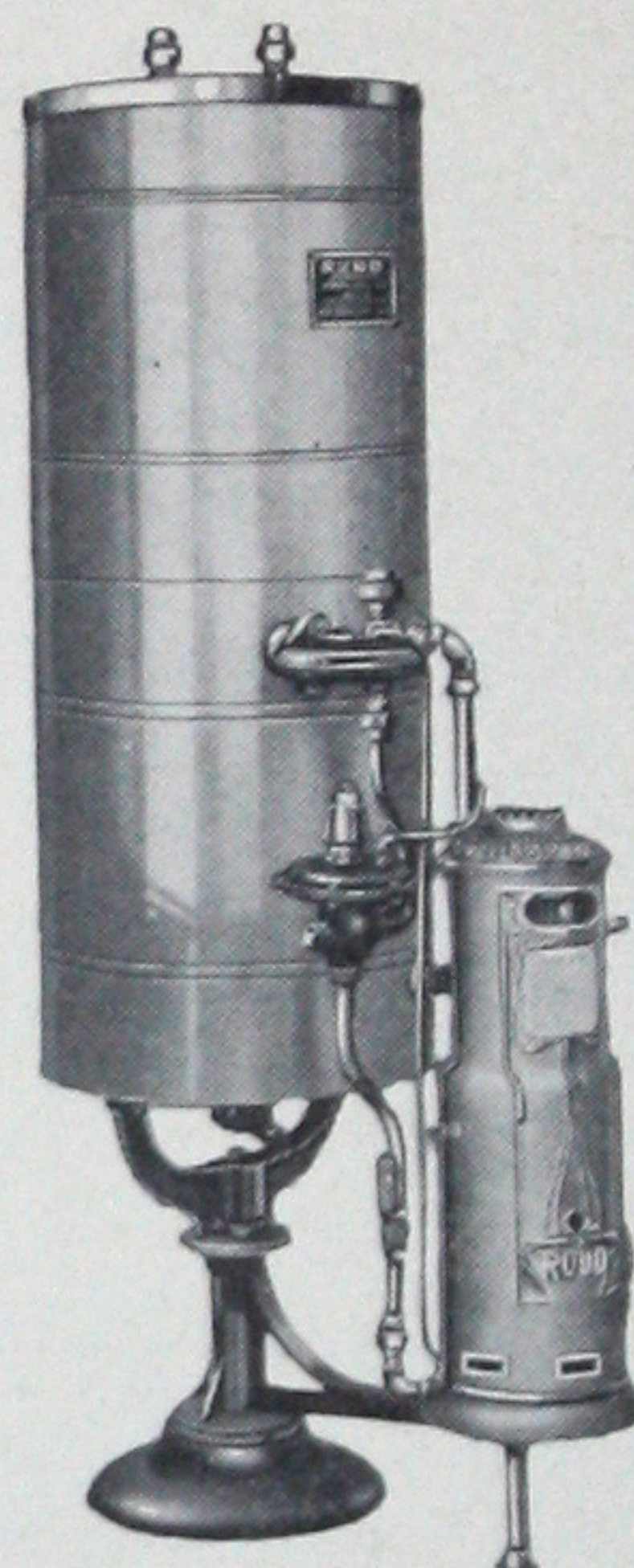
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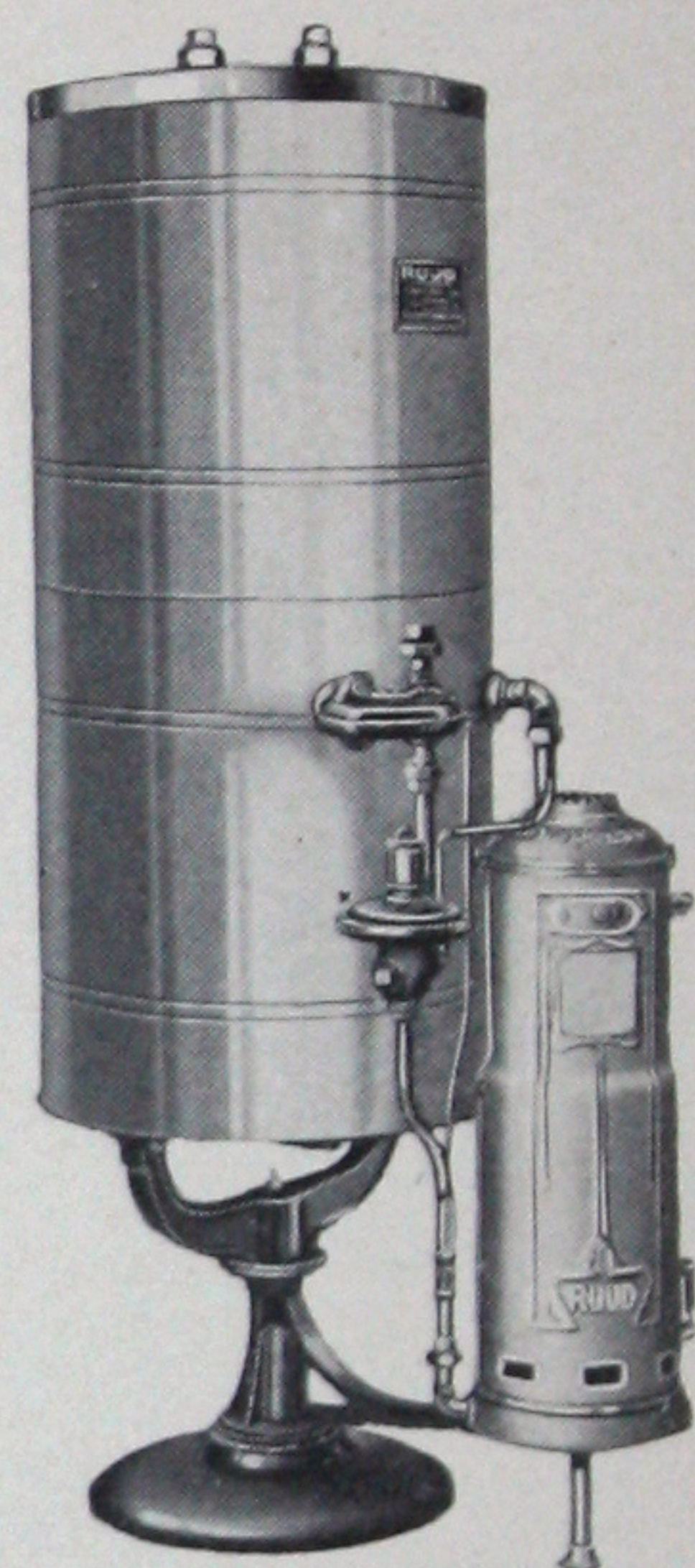
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No. 30



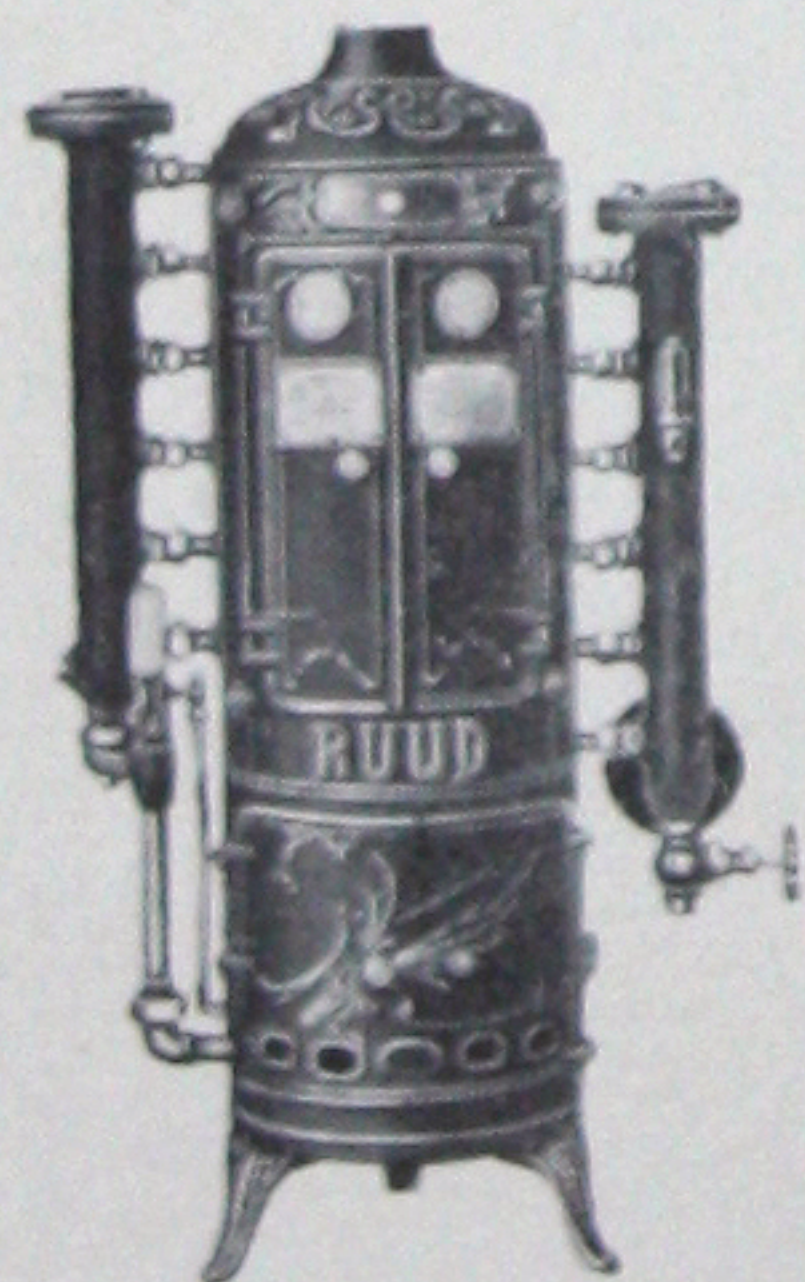
No. 40



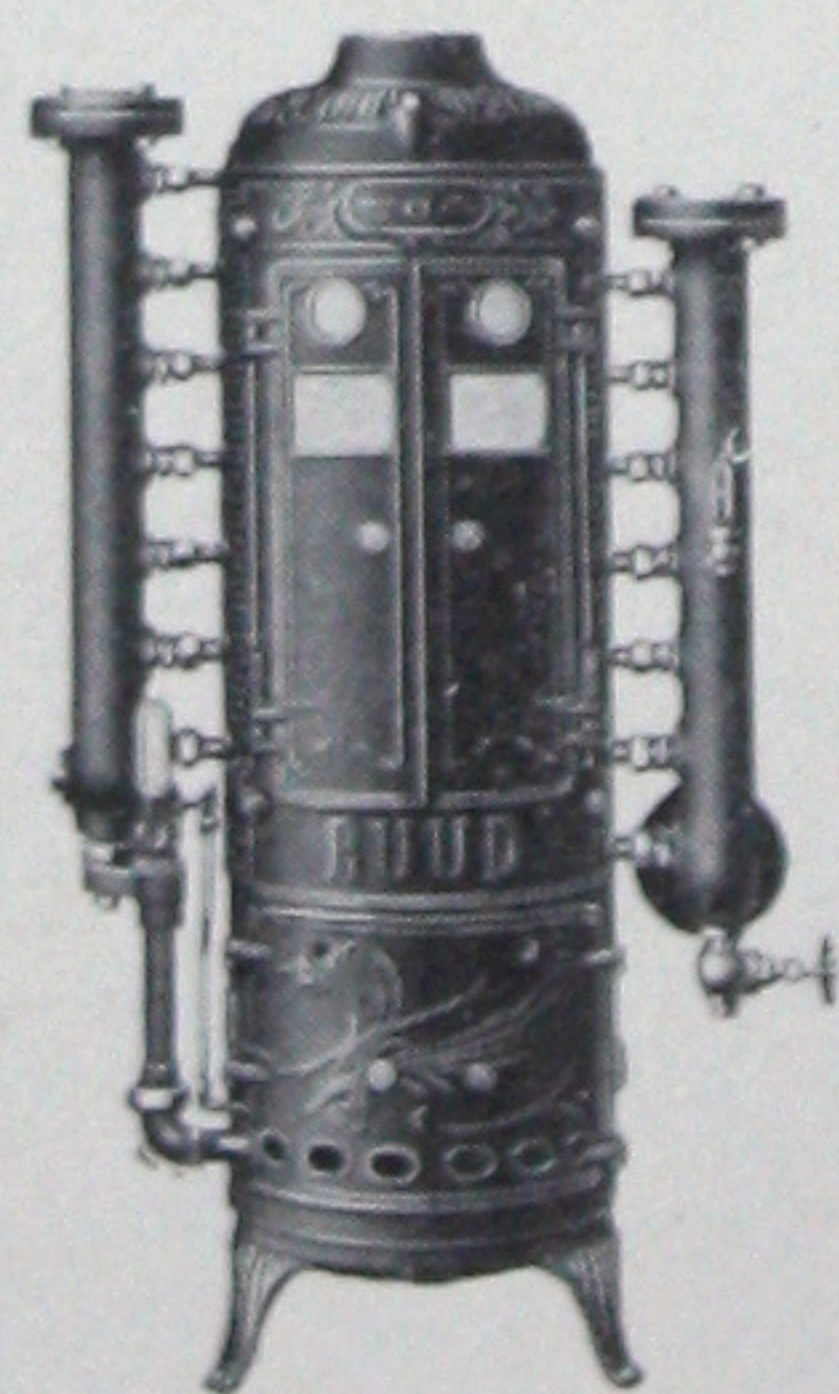
No. 50

Instantaneous Type
For Small Homes
Two Sizes—see pages 14 to 17

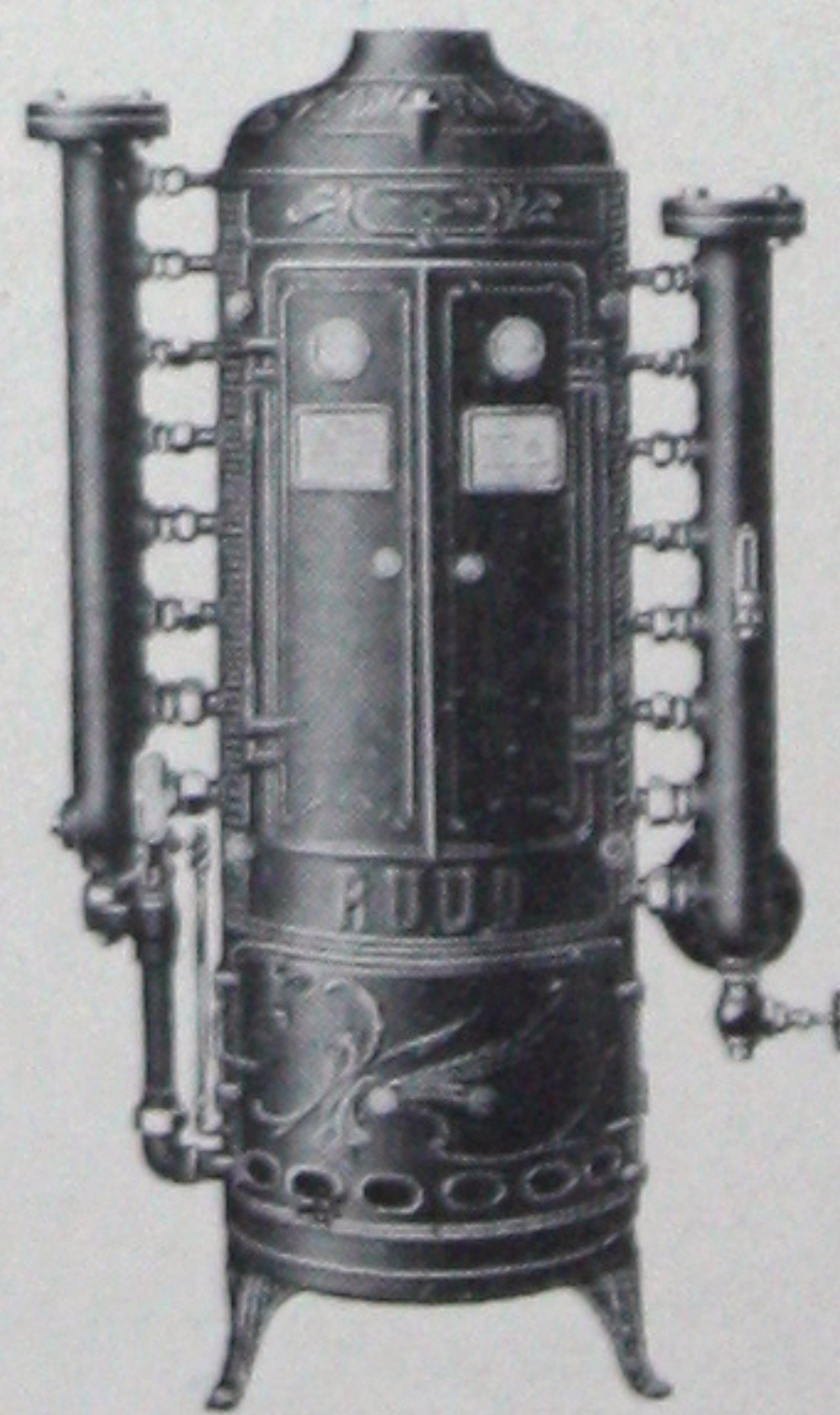
Ruud Automatic Storage Systems for
Domestic Use
Three Sizes—see pages 18 to 24



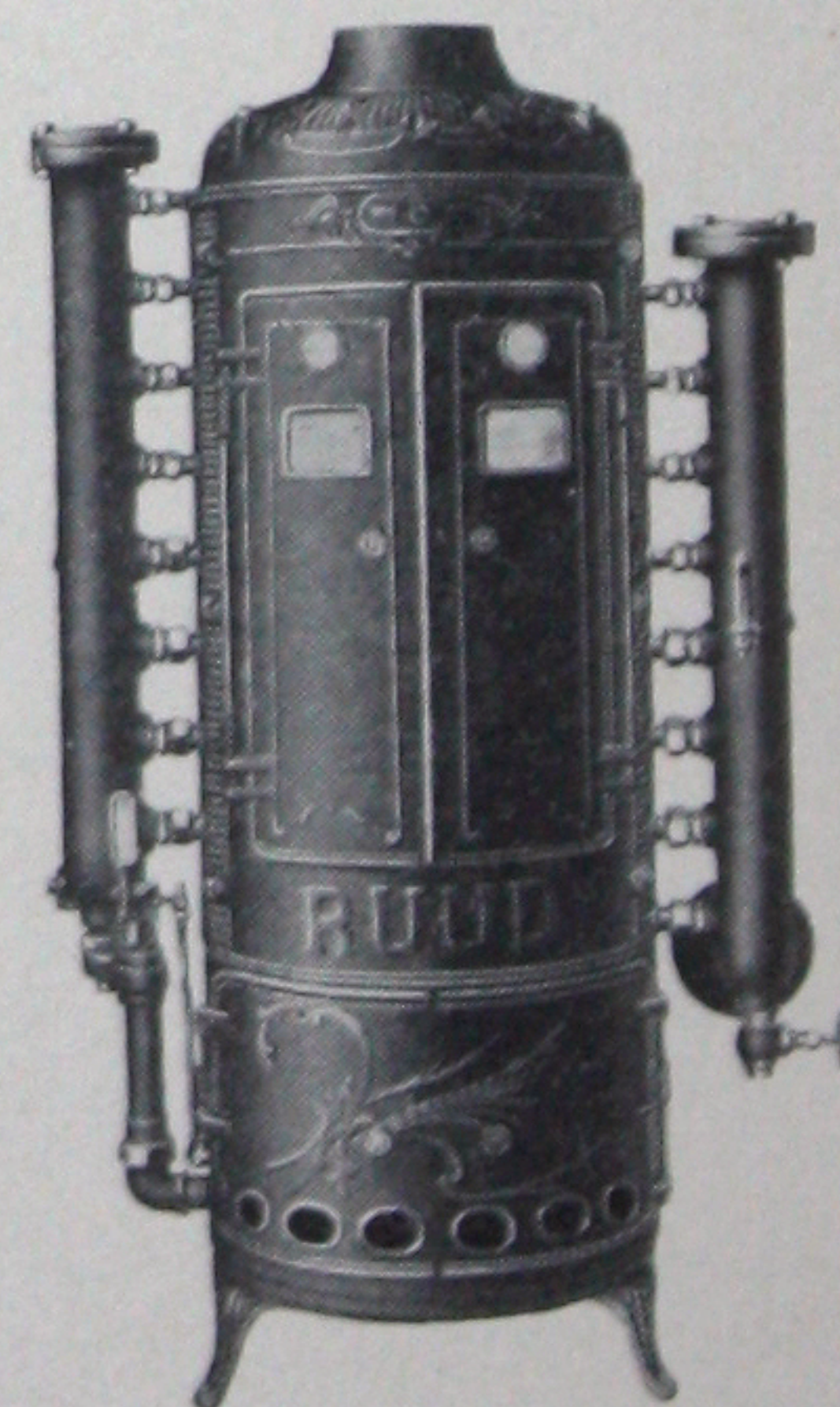
No. 100



No. 200



No. 300



No. 500

Ruud Multi-Coil Automatic Storage Systems
Four Sizes—see pages 25 to 35

Selecting the Right Type

RUUD Automatic Gas Water Heaters are made in two types—Instantaneous Automatic and Automatic Storage—with a wide range of capacities, insuring a suitable size for any given hot water requirement.

1. The Instantaneous Automatic type heats water instantly as it flows and burns gas only when the faucet is open. This type has no tank.
2. The Automatic Storage type burns gas at a comparatively slower rate, storing the heated water in a tank ready for use when needed.

Usually where the hot water requirements are of a nature favoring the instantaneous type over the storage type, or vice versa, it is comparatively easy to make the selection.

INSTANTANEOUS AUTOMATIC TYPE

Where the hot water demand is frequent but limited to a few faucets at one time, the Instantaneous Automatic type is suitable. The total flow of all faucets that will be used simultaneously must not be greater than the rated capacity of the heater.

AUTOMATIC STORAGE TYPE

Where a large number of faucets must be supplied at the same time, but the demand is not ordinarily sustained over long periods, the Automatic Storage type is suitable. Between these demand periods, sufficient time must elapse to enable the heater to replenish the supply of hot water in the tank.

EITHER TYPE

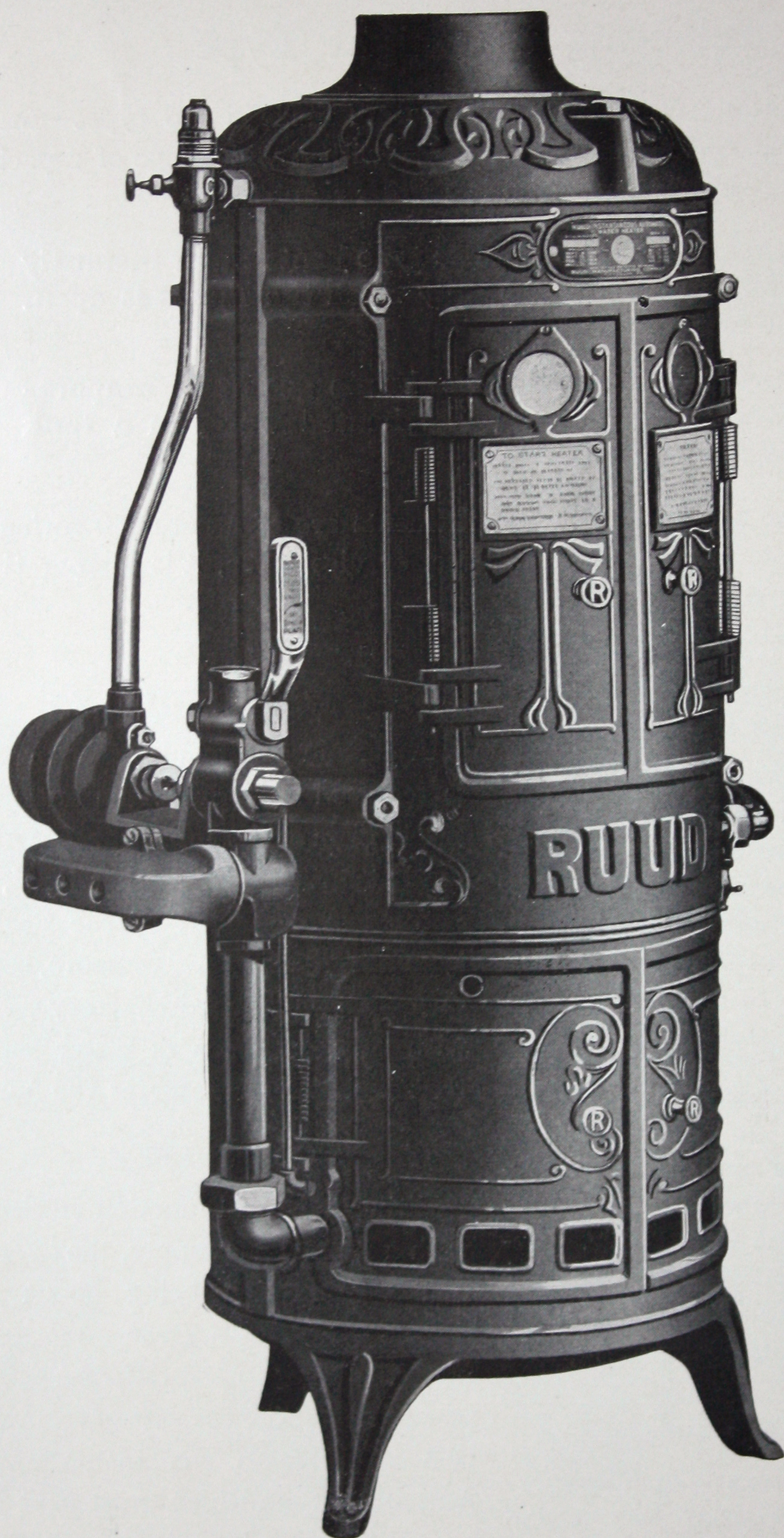
In a great many cases, such as average residences having hot water connections for kitchen, bathrooms and laundry, either type is equally suitable.

WATER SUPPLY

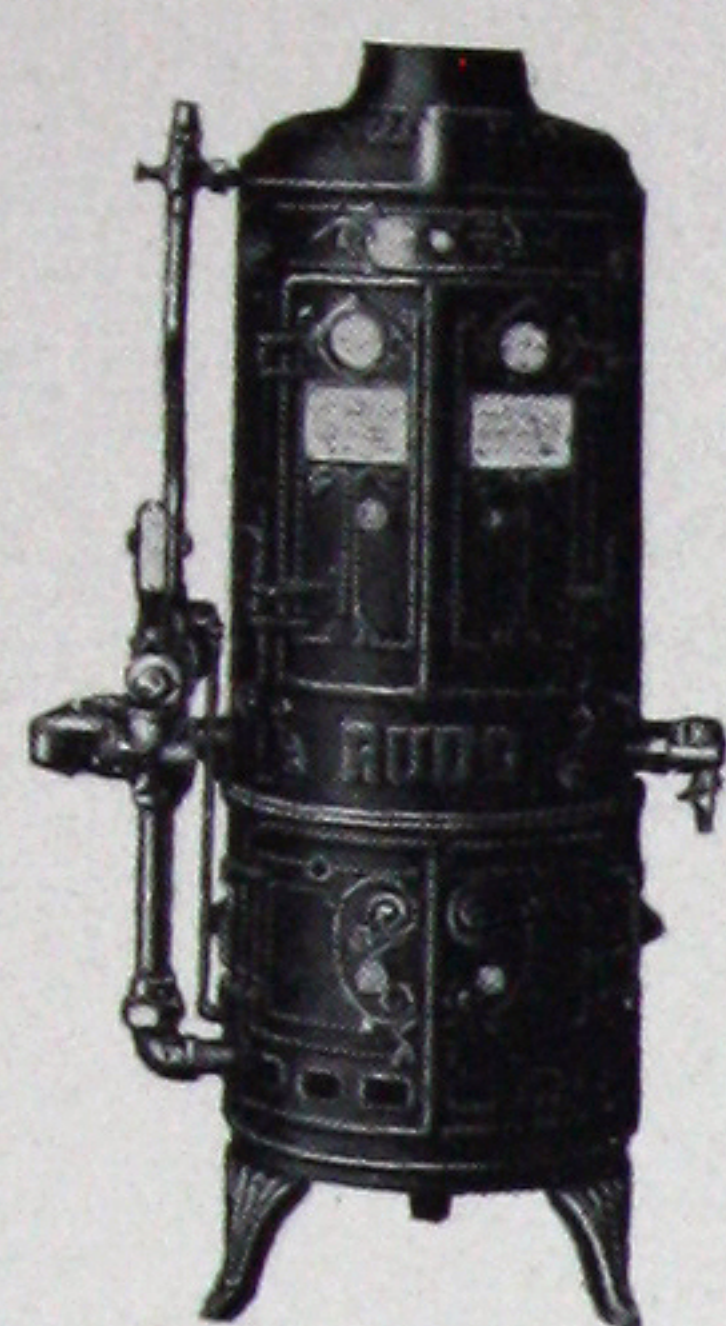
A certain minimum water pressure is required to operate the automatic mechanism of the Instantaneous Automatic type. On the other hand, the automatic operation of the Storage type absorbs no water pressure, consequently it will give satisfactory service with any condition of water supply that will deliver water at the faucet.

GAS SUPPLY

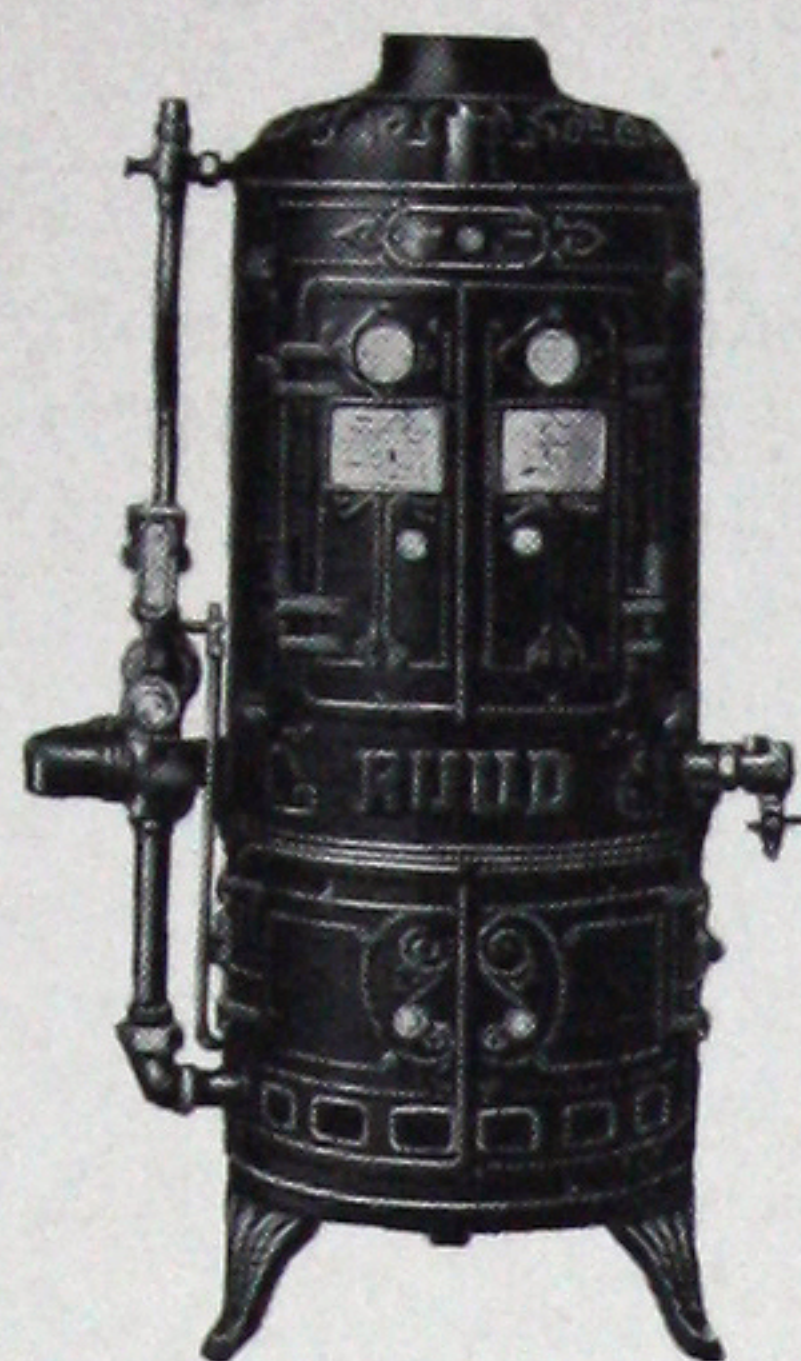
Either type will function efficiently with a normal gas supply, the average fuel consumption being about the same for heating a given quantity of water. Owing to the different principles of operation, the rate of consumption is faster in the Instantaneous Automatic type which must heat water as it flows. The Automatic Storage type uses gas at a slower rate but over longer periods of time.



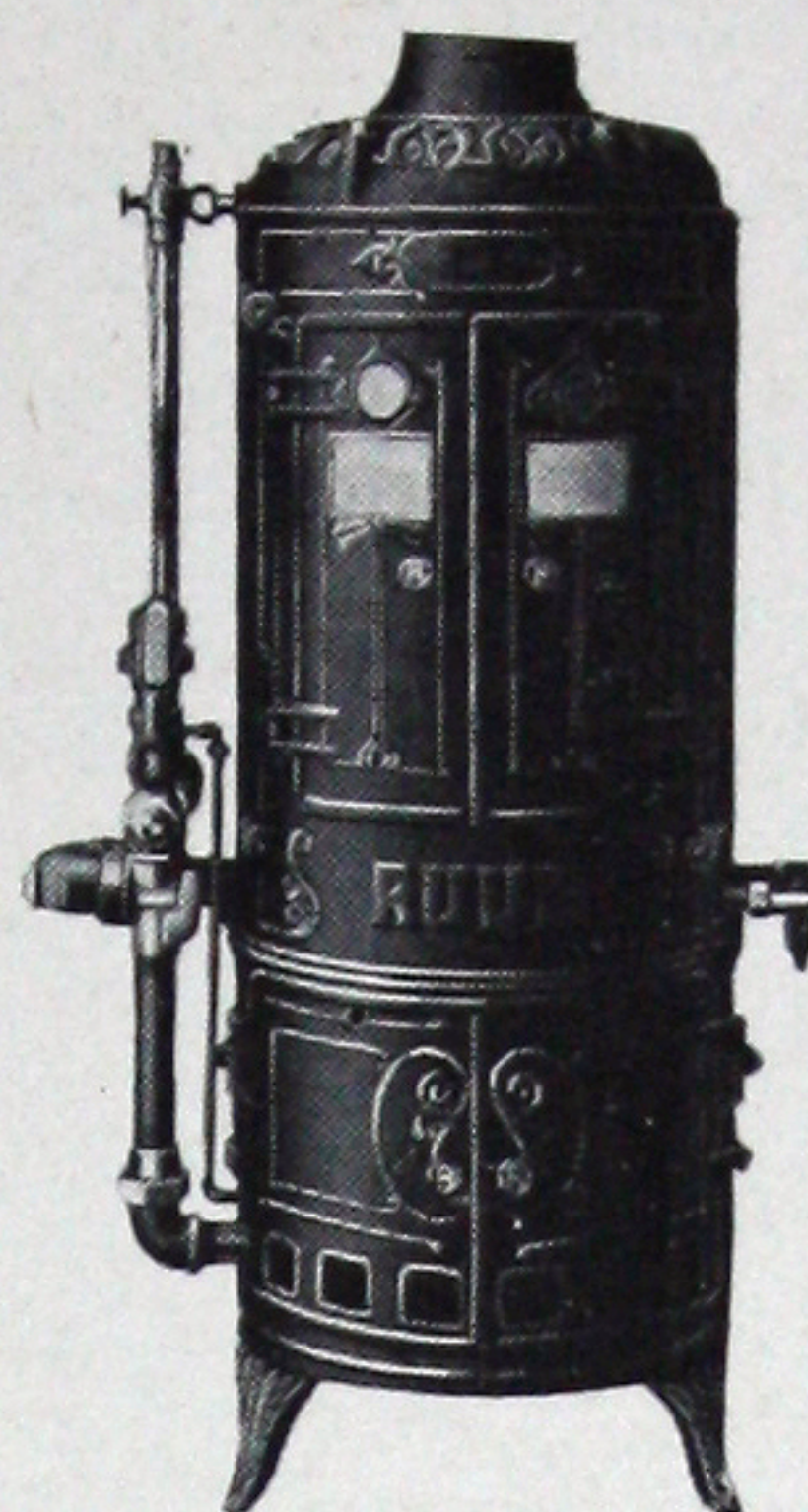
Ruud Automatic Gas Water Heater
Instantaneous Type
Three-quarter view showing automatic mechanism



No. 3



No. 4



No. 6



No. 8

RELATIVE SIZES

Ruud Automatic Gas Water Heaters

Instantaneous Type

The heaters here shown, Nos. 3, 4, 6 and 8, are known as the "standard sizes," because they more closely meet the standard requirements of residences, stores, offices and factories. A number of heaters, installed in multiple or battery form, extends the service capacity to any desired scale.

Their outstanding characteristics are instant, ever-ready service, combined with an

inexhaustible hot water supply and the highest attainable operating efficiency.

When properly connected to water and gas pipes, all cold water passing through the heater is changed into hot water, thus giving running hot water service at the faucet—automatically. Gas is burned only when hot water is flowing, and the service rendered is just as dependable as the gas and cold water supplies.

SELECTION OF SIZE

Size Heater	Capacity per minute at 63° Temperature Rise	APPLICATION
No. 3	Gallons 3	Adapted to small dwellings having bathroom, kitchen and laundry.
No. 4	4	The standard size for average modern homes, having kitchen, two bathrooms and laundry.
No. 6	6	Suitable for dwellings with two or three bathrooms, butler's pantry, laundry, and one or more hall or bedroom lavatories. Also adapted to small duplexes.
No. 8	8	For large homes with three to six bathrooms and several lavatories and laundry. Also suitable for small hotels, small apartment houses and restaurants.

The table is a quick reference for estimating the size heater required for residences. The basis for determining the proper size is the number of faucets that must be supplied at one time, and the rate of flow from each in gallons of hot water per minute. The total number of gallons required per minute indicates the correct size heater.

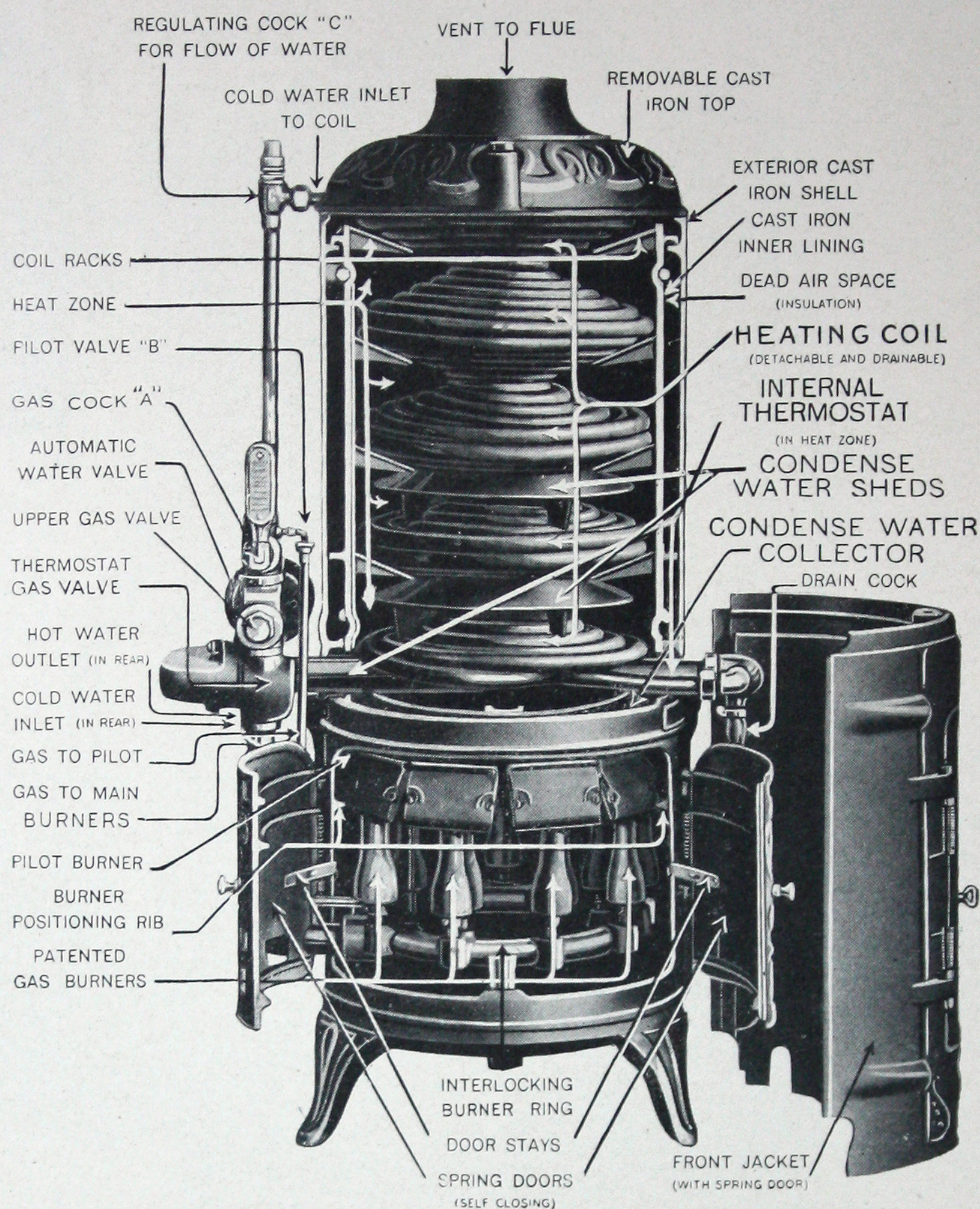
For any given amount of hot water, a larger size RUUD uses no more fuel than a smaller size. In case of doubt, always install the next size larger. When confronted with unusual conditions, write the general office or the nearest branch, giving full information.

In this connection we suggest a study of

pages 36 and 37 which discuss the relation of heater capacities to the temperature of the incoming water.

APARTMENTS

For small apartments, assume a need of three gallons per minute per family and select a heater having two-thirds of the total capacity necessary, since not more than two-thirds of the fixtures will likely be drawing hot water simultaneously. Thus an apartment house with four one-bathroom apartments would have a total requirement of twelve gallons per minute and a No. 8 heater would be suitable.



General Features of Construction

SHELL

Best grade light gray iron castings. Sectional construction for ease of dismounting and for low maintenance cost. Back section has double spring doors on upper half, both upper and lower front sections have double spring doors. Cast iron inner lining provides dead air space insulation for entire heat zone. All parts assembled by heavy bolts as few in number as possible.

COILS

Eighteen gauge seamless "Premium" copper tubing, tested to 1,000 pounds per square inch, and again to 300 pounds after assembly. Coil sections joined by brazed joints or by detachable couplings when so ordered.

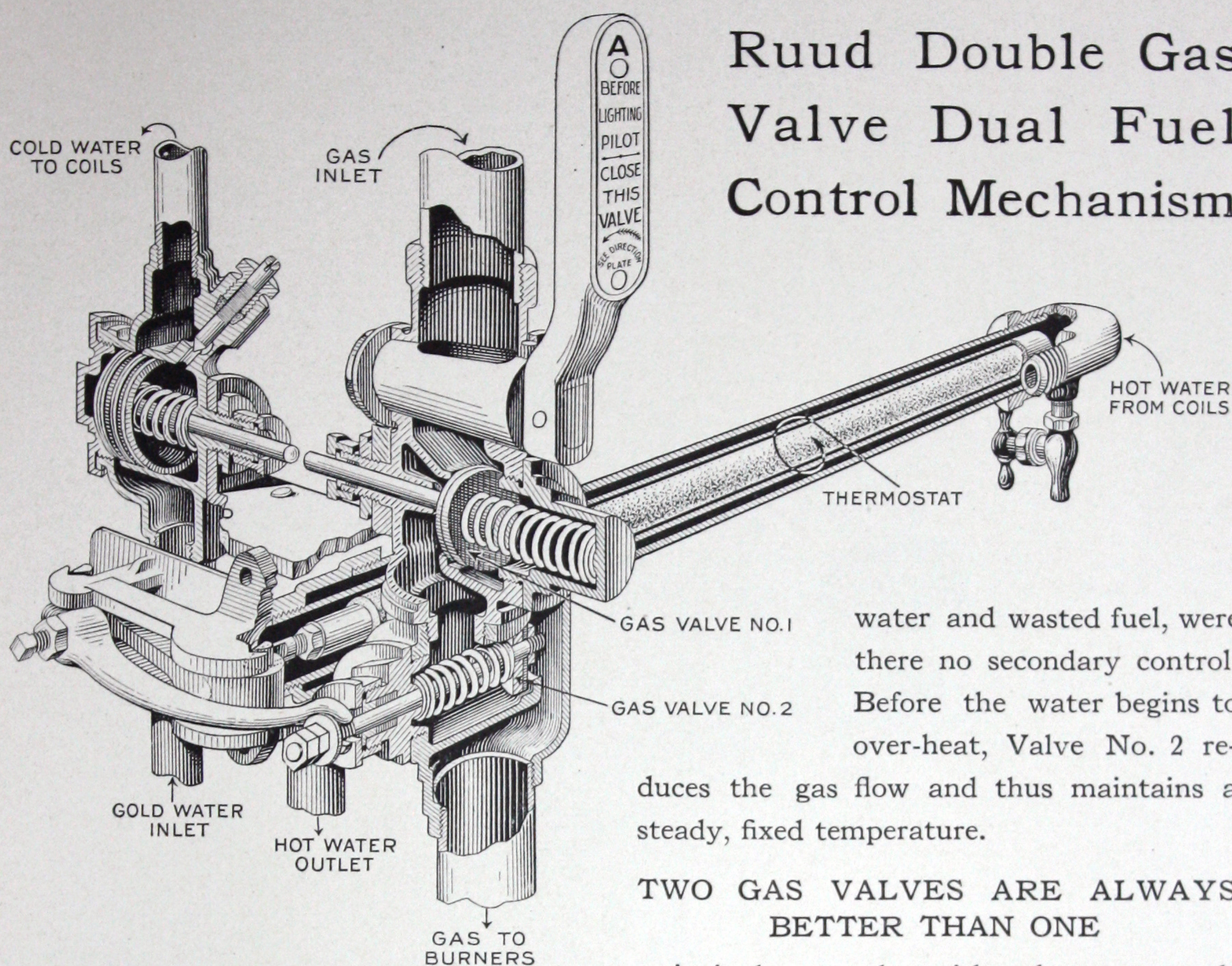
BURNERS

RUUD standard burners of gray iron castings, with separable cap and perforated flat brass flame check, all held firmly as a unit by two brass bolts. Mounted on brass spuds with detachable orifice caps; easily dismounted, no matter how long in service.

CONDENSATION SHEDS AND COLLECTOR

Two circular cast iron sheds divert the water of condensation from lower coils to shell liners, then downward to an iron collector ring and through a lead tube to the outside of heater. This protection of the heater coils, burners and base against the destructive action of condensation is an exclusive RUUD feature.

Ruud Double Gas Valve Dual Fuel Control Mechanism



The successful heating of running water by gas was made possible by the development of the RUUD double gas valve mechanism, each valve independent of the other and having its own control.

Gas Valve No. 1 is operated by the water flow. It turns the gas on and off as a faucet is opened and closed.

Gas Valve No. 2 is operated by the temperature of the water as it leaves the heater. It assumes complete control of the gas flow after Valve No. 1 is open, passing only enough gas to maintain the water being drawn at the desired temperature.

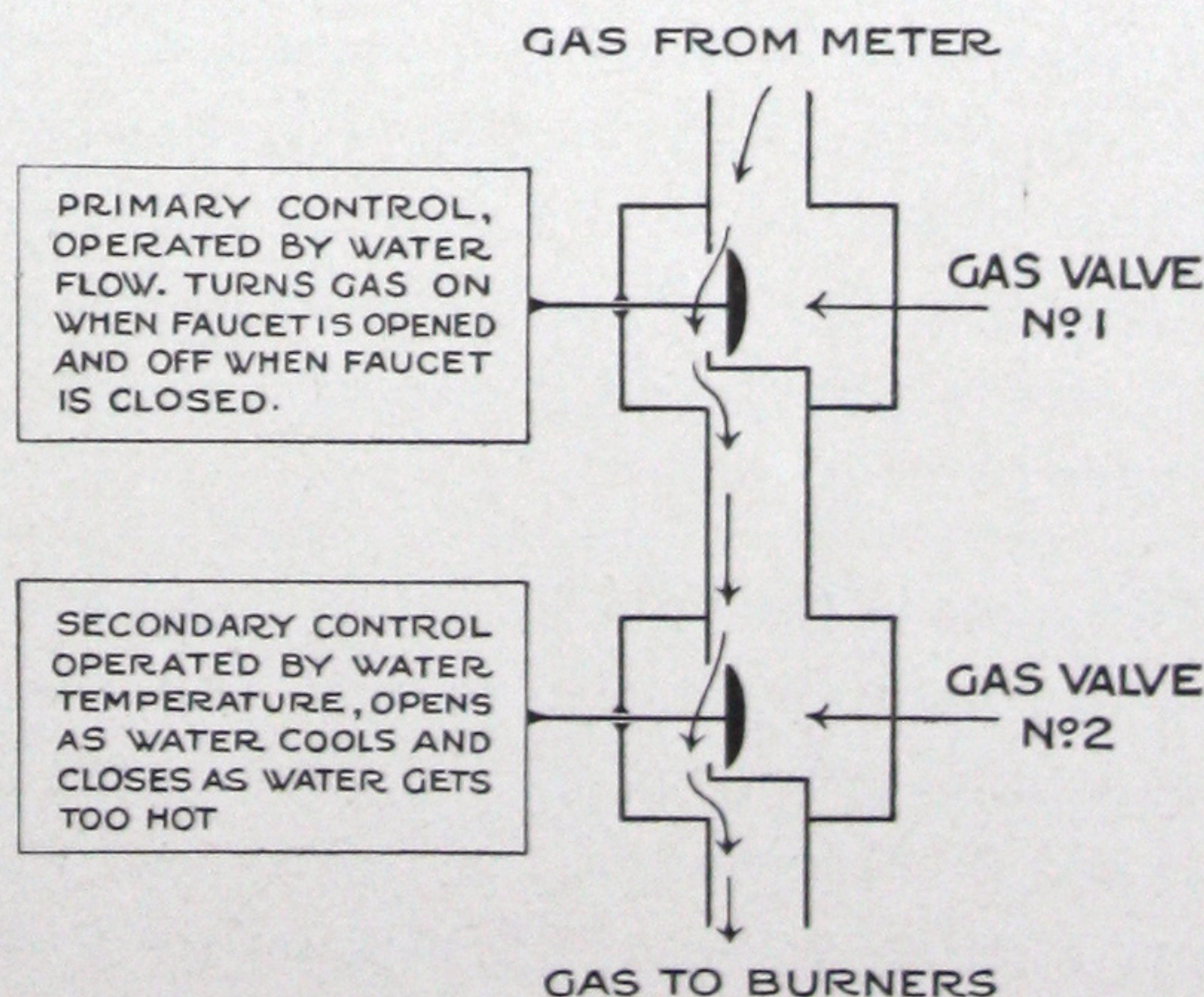
Assume that a heater with a rated capacity of four gallons per minute is supplying a faucet flowing only two gallons per minute. Gas Valve No. 1, which is open wide all the time hot water is flowing, passes a full flow of gas and the result would be overheated

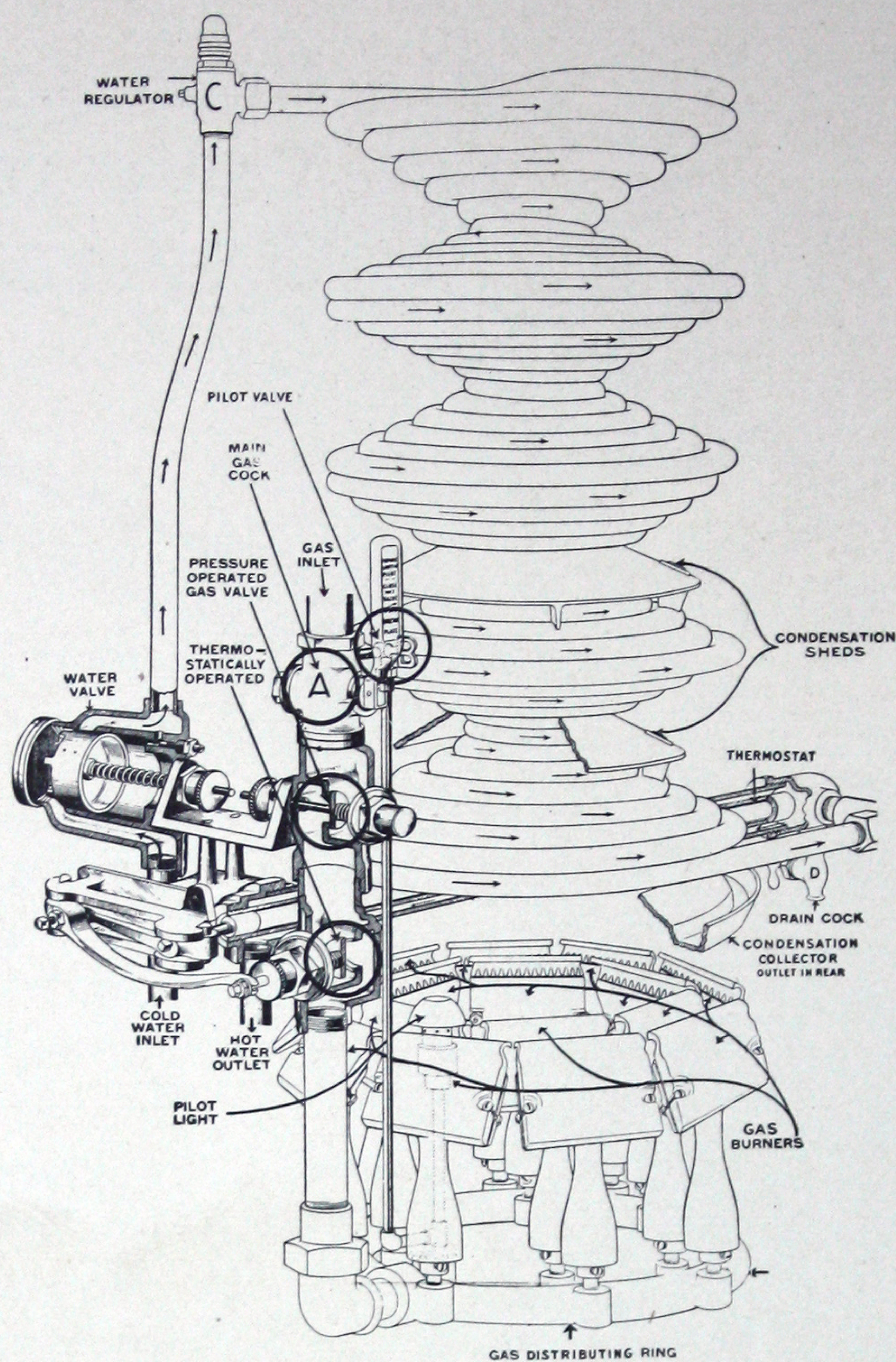
water and wasted fuel, were there no secondary control. Before the water begins to over-heat, Valve No. 2 reduces the gas flow and thus maintains a steady, fixed temperature.

TWO GAS VALVES ARE ALWAYS BETTER THAN ONE

A single gas valve with only one control, or even two controls when both are connected to the same gas valve, is not so reliable as two separate independent gas valves, each having its own control.

Should the flow control fail to function and stick its gas valve in an open position, Gas Valve No. 2 will insure uninterrupted service as well as prevent damage to the heater or plumbing by overheated water.





Maximum Heating Efficiency

The arrangement, winding and spacing of RUUD coils is the result of years of experience and painstaking test. The result is the highest known heating efficiency and fuel economy.

Cold water is introduced at the top of the coil and withdrawn at the bottom. At any and every point in the heat zone the greatest possible difference in temperature between the water in the coils and the surrounding hot gases is maintained, resulting in a rapid transfer of heat.

The gases in the upper portion of the heat zone are naturally cooler than in the lower part, having given up the greater part of the heat. However, the water in the upper section of the coil is still colder than

the gases at this point, consequently the remaining heat is absorbed, permitting little or no heat to pass out through the flue.

If the cold water were introduced at the bottom of the coil, at some point in its travel upward it would become so near the temperature of the surrounding gases that the remaining heat, instead of being absorbed by the water, would pass out through the flue and be lost.

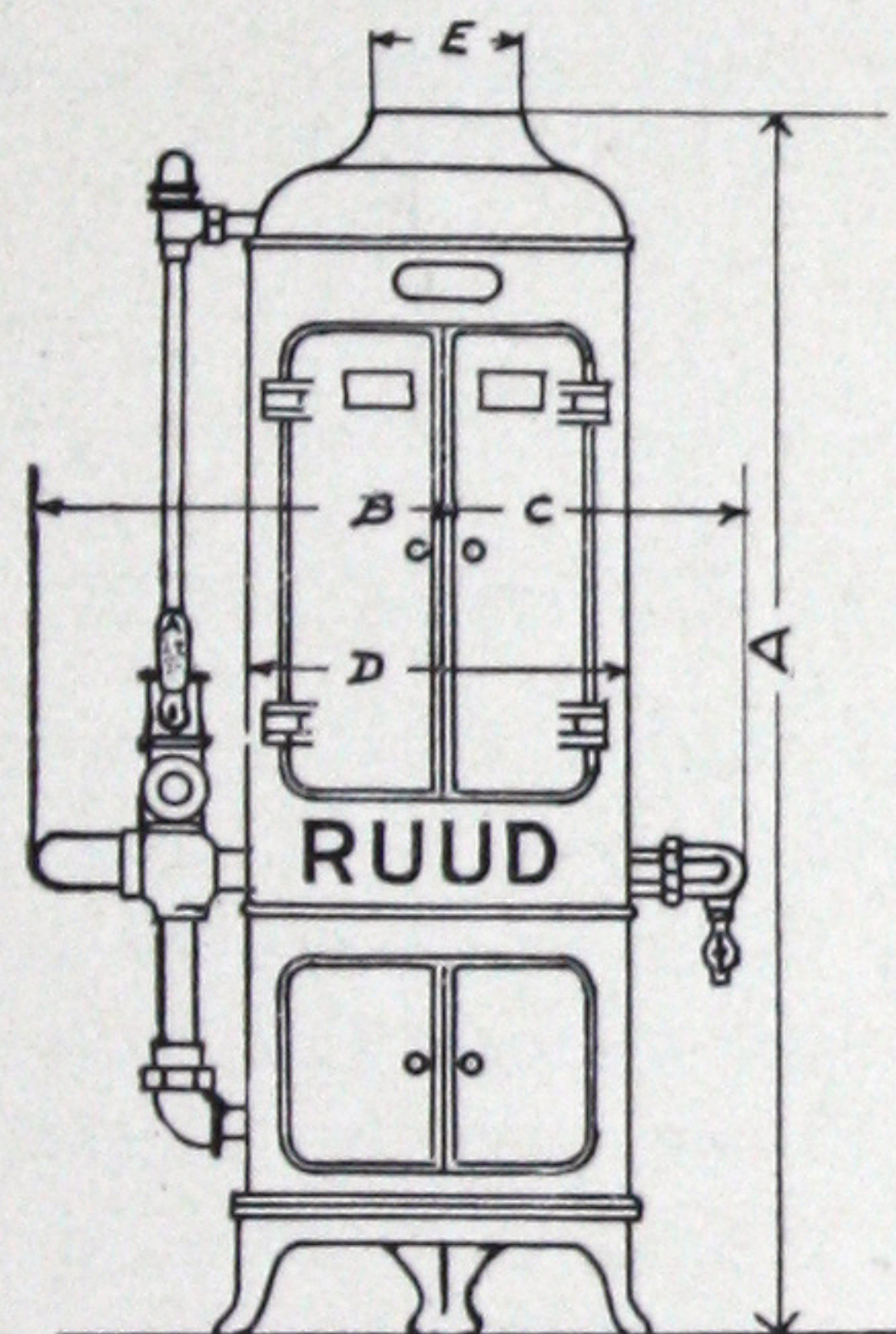
A SIMPLE TEST

The temperature in the heat zone just above the burners is about 2,000 degrees F. The hand may be held over the vent at the top of the RUUD, without discomfort, showing that practically all of the heat is passing into the water.

General Table—Ruud Automatic Gas Water Heaters Instantaneous Type

Size Heater	Height Over All "A"	Width Over All "B and C"	Diameter Shell "D"	Size Water Inlet	Size Water Outlet	Gas Consumed per Minute		Size Meter	Size Gas Line	Size Flue "E"	Weight Net	Weight Crated
	Inches	Inches	Inches	Inches	Inches	cu. ft. Art.	cu. ft. Nat.	Lt.	Inches	Inches		
No. 3.....	45½	25¾	14½	½	½	4	2	30	1	6	270	330
No. 4.....	47¼	27⅞	16⅜	½	½	5	3	45	1¼	6	330	395
No. 6.....	55½	30⅝	19	¾	¾	7½	4	60	1½	7	475	560
No. 8.....	58½	32⅜	21¼	¾	1	10	6	80	2	8	575	670
No. 4, Low Pressure....	47¼	27⅞	16⅜	¾	¾	5	3	45	1¼	6	330	380
No. 6, Low Pressure....	55½	30⅝	19	1	1	7½	4	60	1½	7	475	540
No. 8, Low Pressure....	58½	32⅜	21¼	1	1	10	6	80	2	8	575	670

NOTE—A minimum water pressure of 25 pounds at the highest faucet is required for standard heaters. If the pressure is below 25 and above 5 pounds, use the low pressure type—Nos. 4, 6 and 8 can be furnished for low pressure operation. If the pressure is below 5 pounds, use the storage type.



Heater Dimensions

Size	A	B	C	D	E
	Inches	Inches	Inches	Inches	Inches
No. 3	45½	14¾	11	14½	6
No. 4	47¼	15⅞	12	16⅜	6
No. 6	55½	17¼	13⅜	19	7
No. 8	58½	18⅜	14	21¼	8

Flow in Gallons per Minute Delivered by Ordinary Plumbing Fixtures

Fixture	Fair Flow	Good Flow	Excellent Flow
Kitchen Sink Bibbs.....	2	4	6
Pantry Sink—High Goose Neck Bibbs...	2	2	3
Pantry Sink—Large Plain Bibbs.....	4	6	8
Vegetable Sink Bibbs.....	2	4	6
Laundry Tray Bibbs.....	4	6	8
Slop Sink Bibbs.....	3	4	6
Lavatory Basin Bibbs.....	2	3	4
Bath Tub Bibbs.....	3	4	6
Shampoo Spray.....	½	1	2
Liver Spray.....	1	2	3
Shower Baths.....	..	..	..
5-inch Rain Heads.....	2	3	4
6½-inch Rain Heads.....	2	3	5
8-inch Rain Heads.....	4	6	8
8-inch Tabular Heads.....	6	8	10
Needle Baths.....	20	30	40
Manicure Tables.....	1	1½	2

This table was compiled from actual tests on a water pressure of 30 pounds per square inch. It is intended to set forth what is, in our opinion, only a proper flow from the fixtures. It does not give the largest flow possible in any case. That is governed by the water pressure. Differences will be found among similar fixtures made by different manufacturers. In explanation of the three rates of flow listed, it should be noted that by "Fair Flow" is meant a stream just large enough to render what might be called good service, by "Good Flow" is meant a stream which in most households would be entirely satisfactory, and by "Excellent Flow" is meant a flow which, if increased to any great extent would cause annoyance by splashing and noise.

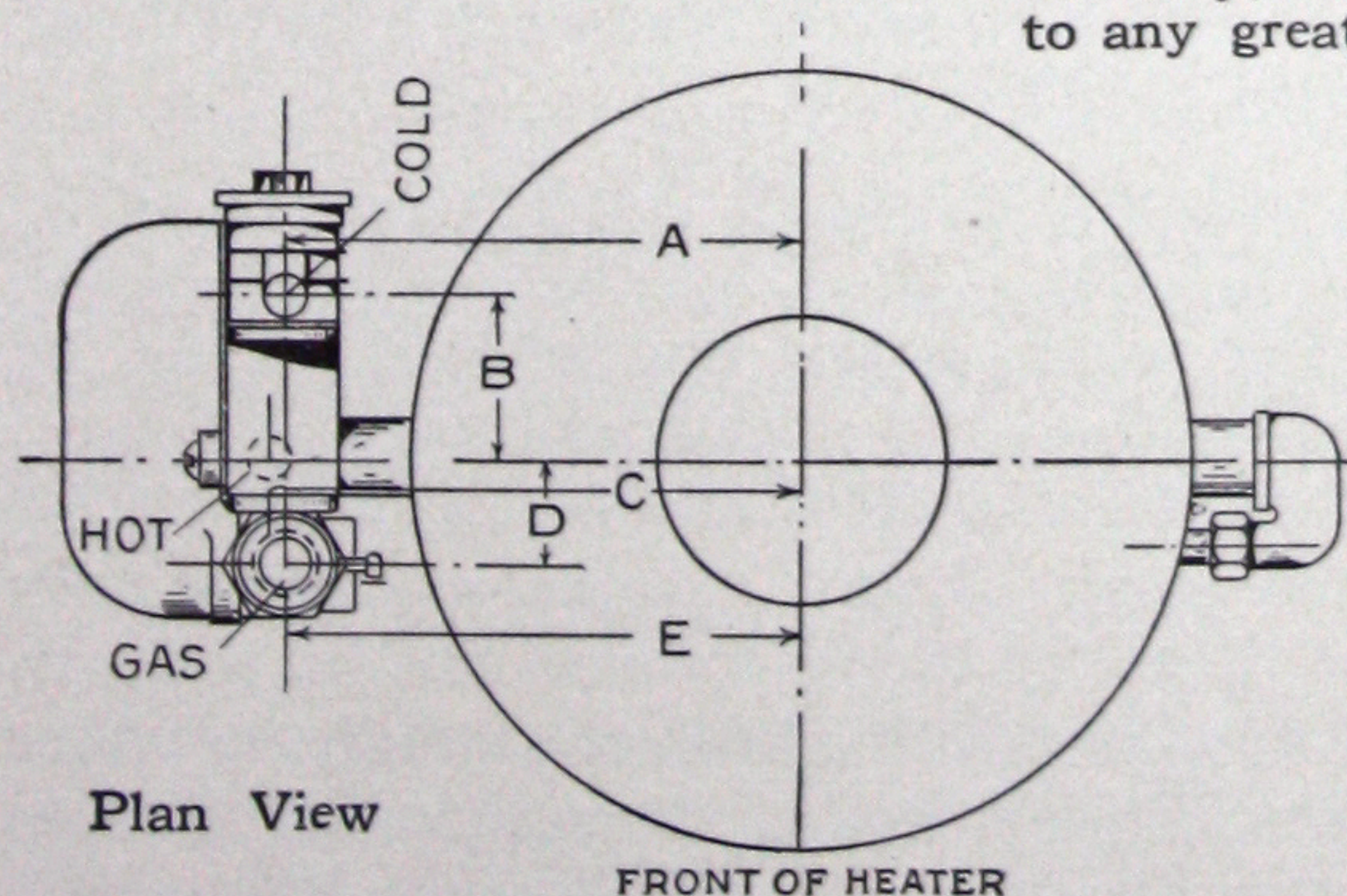
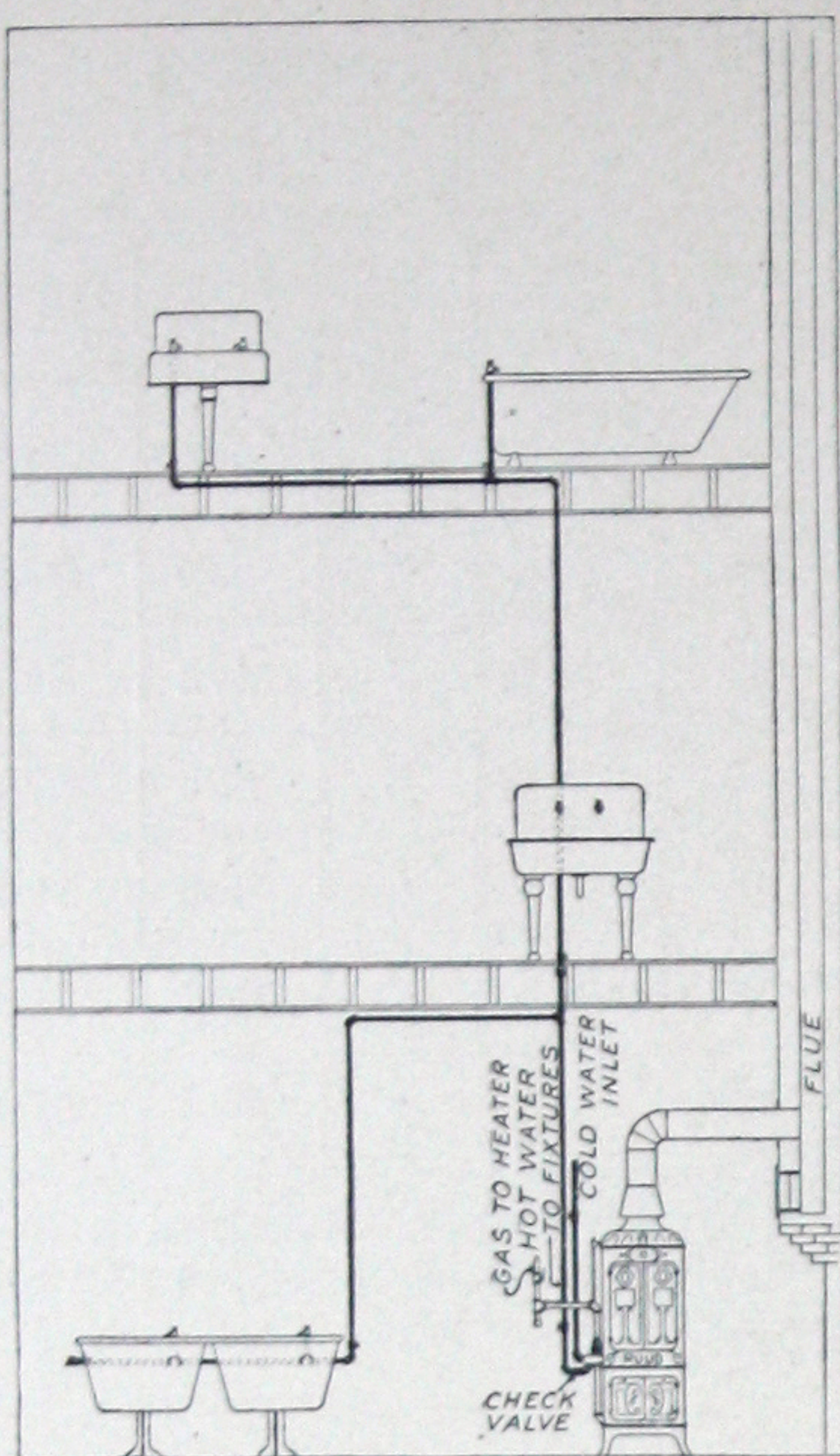


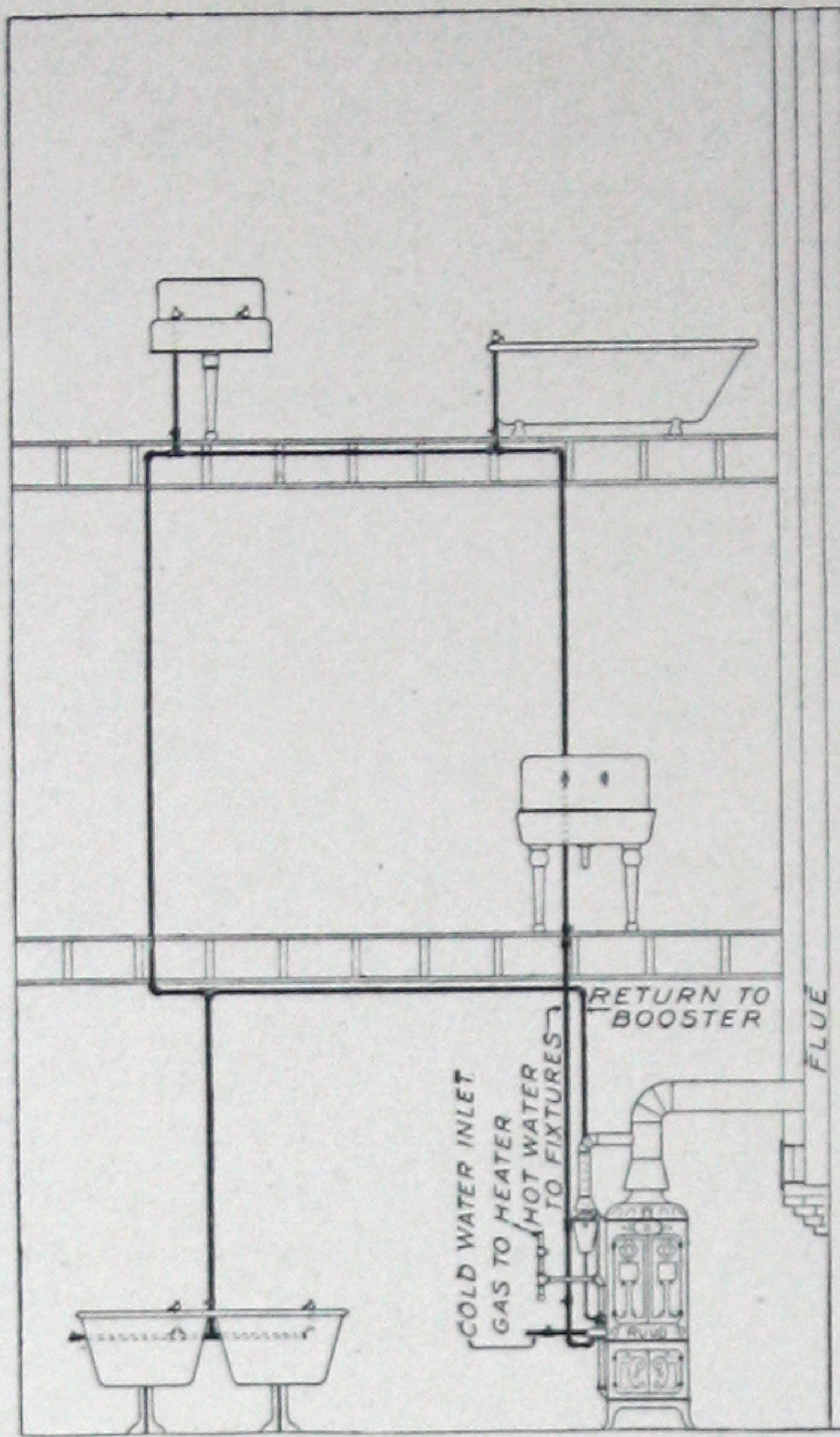
Table of Roughing-in Measurements

NOTE—These measurements also apply to No. 4, 6 and 8 Low Pressure Heaters

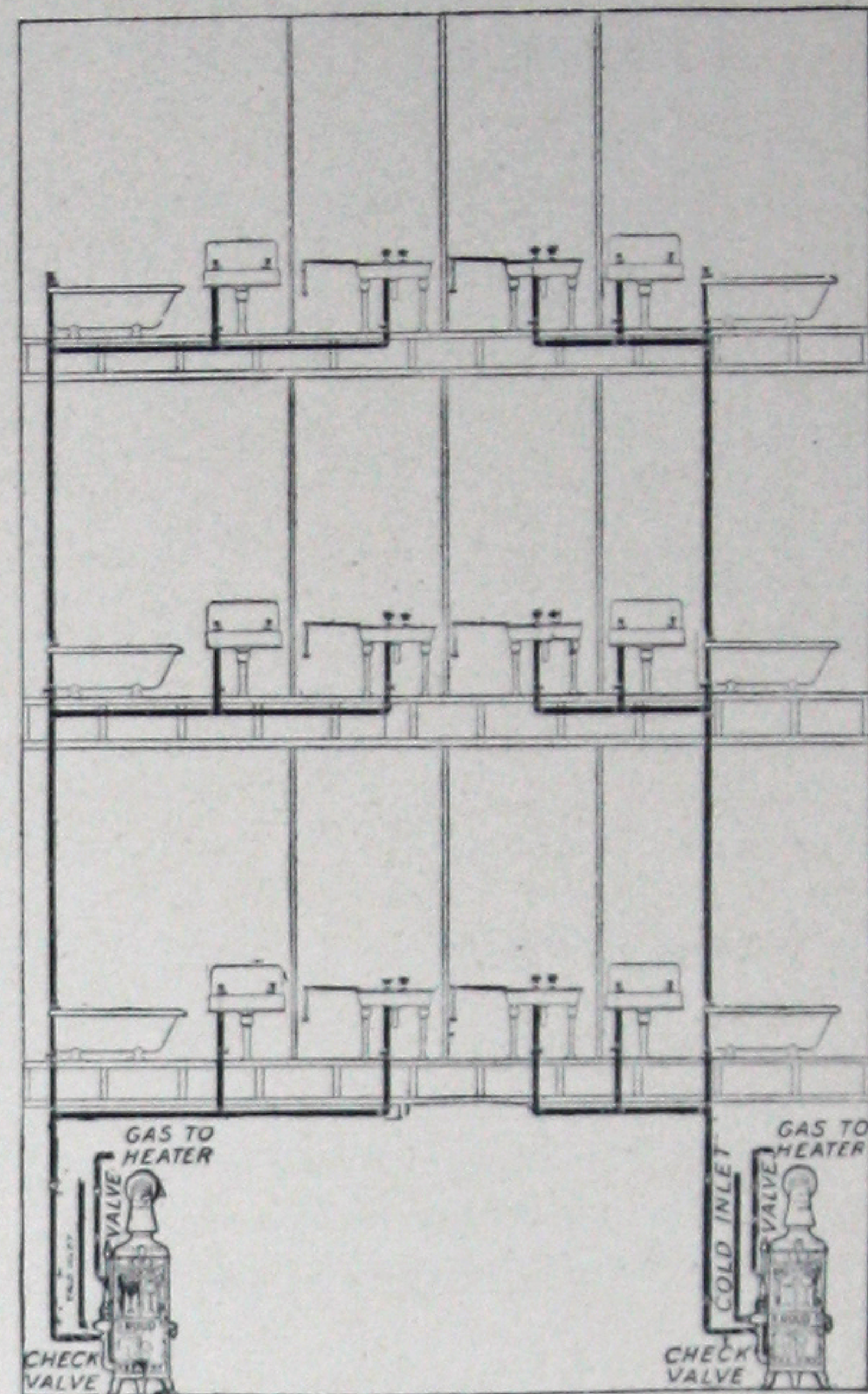
Heater	A	B	C	D	E
	Inches	Inches	Inches	Inches	Inches
No. 3....	10	3½	10⅝	2¼	10
No. 4....	10⅞	3½	11	2¼	10⅞
No. 6....	12⅜	3½	12⅝	2⅜	12⅜
No. 8....	13¾	3½	14	2⅜	12¾



The Ruud installed on a direct system of plumbing.



The Ruud installed on a return circulation system of plumbing.



Two Ruuds installed in a six-apartment building.

Installation Information

LOCATION OF HEATER

Careful attention must be given to the location of the heater. Accessibility to a flue having a good draft is the first consideration.

Then place the heater as near as possible to the most used fixture, usually the kitchen sink. The shorter the distance hot water must travel, the better. It is often advisable to group the fixtures in large buildings, installing a separate heater for each group instead of one large heater. Covering the hot water line from heater and the risers with insulation pays for the cost in fuel saved.

FLUE CONNECTION

The RUUD must be connected to a flue having a good draft. Avoid long flat runs of flue pipe and never reduce the size. The RUUD draft hood should always be used and must be placed in a vertical position. It prevents down drafts from entering the heater.

GAS CONNECTION

Run the gas line direct from meter to the heater. Piping and meter should never be smaller than recommended in the general table. If gas line is over 100 feet long, use a size larger. Put a stop or valve between the meter and heater.

HOT WATER CONNECTION

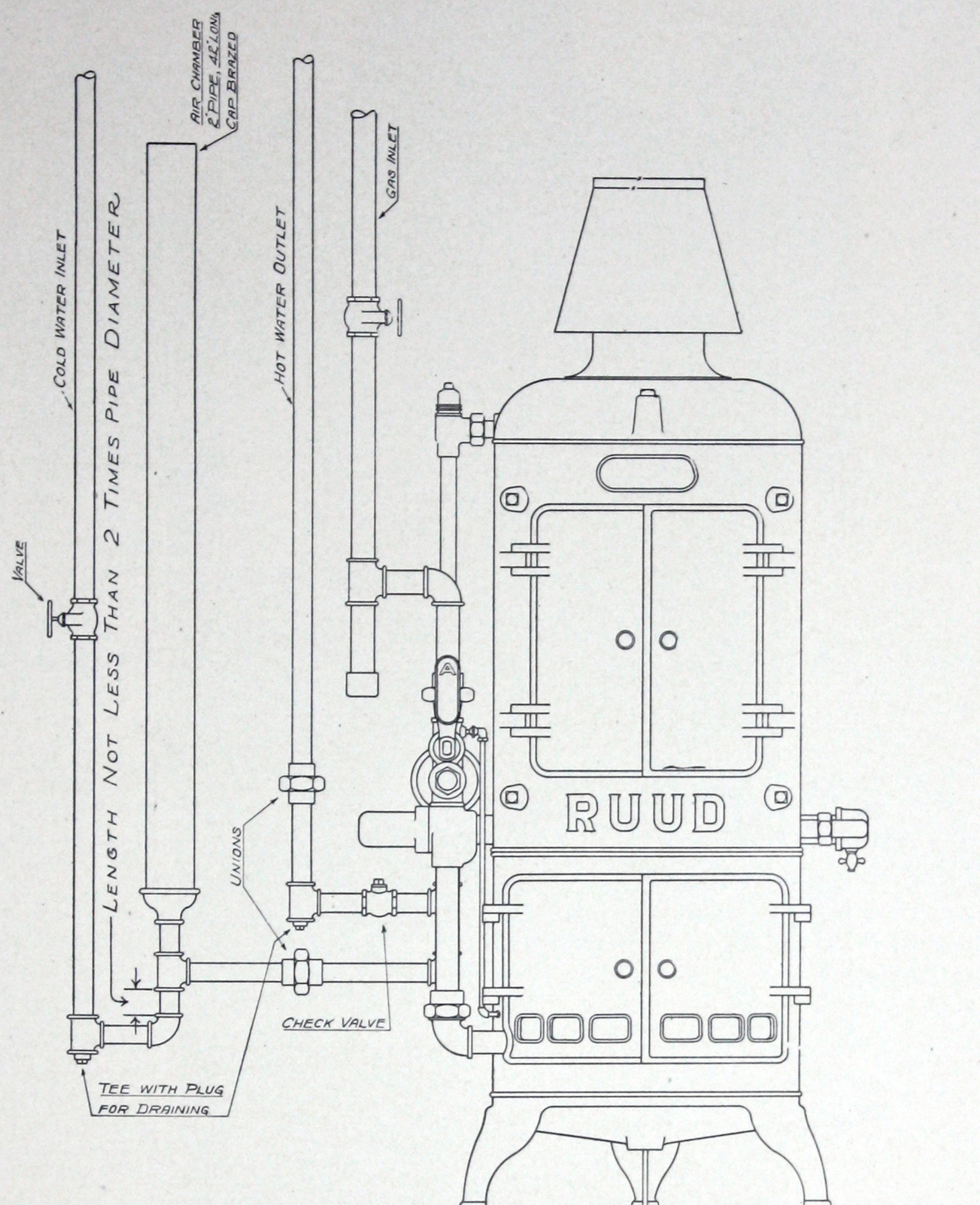
Hot water line should not be larger than heater outlet, and smaller if possible. Larger sizes mean more cold water to be emptied from the line before hot water is delivered at the faucet. It is sometimes advisable to run a separate small line to a frequently used far-away fixture.

CHECK VALVE

Install a check valve on the hot water line close to the heater. It prevents water in the hot lines from flowing back down through the heater when water flow or pressure is poor and a cold water faucet on the lower floors is opened. If this occurs the heater operates when the cold water faucet is closed and while the hot water lines are filling up again.

COLD WATER CONNECTION

The cold water line should never be smaller than the inlet connection to heater. When the water pressure is low, it should be a size larger. Install a valve on the line near the heater so the cold water can be shut off without interfering with the supply to other parts of the building. Never close this valve without first turning off all gas to the heater.



Proper Installation of Air Chamber

It is frequently necessary to install an air chamber on the cold water line as shown. It prevents reaction and consequent flashing of burners caused by the sudden closing of a cold water faucet when the pressure is high. A quick stoppage of the rapidly moving column of water creates a pressure in the inlet line that is greater than the normal pressure in the hot water lines. If installed properly, the direct thrust of this sudden pressure will be cushioned and absorbed by the air chamber before it reaches the mechanism of the heater.

CONDENSATION

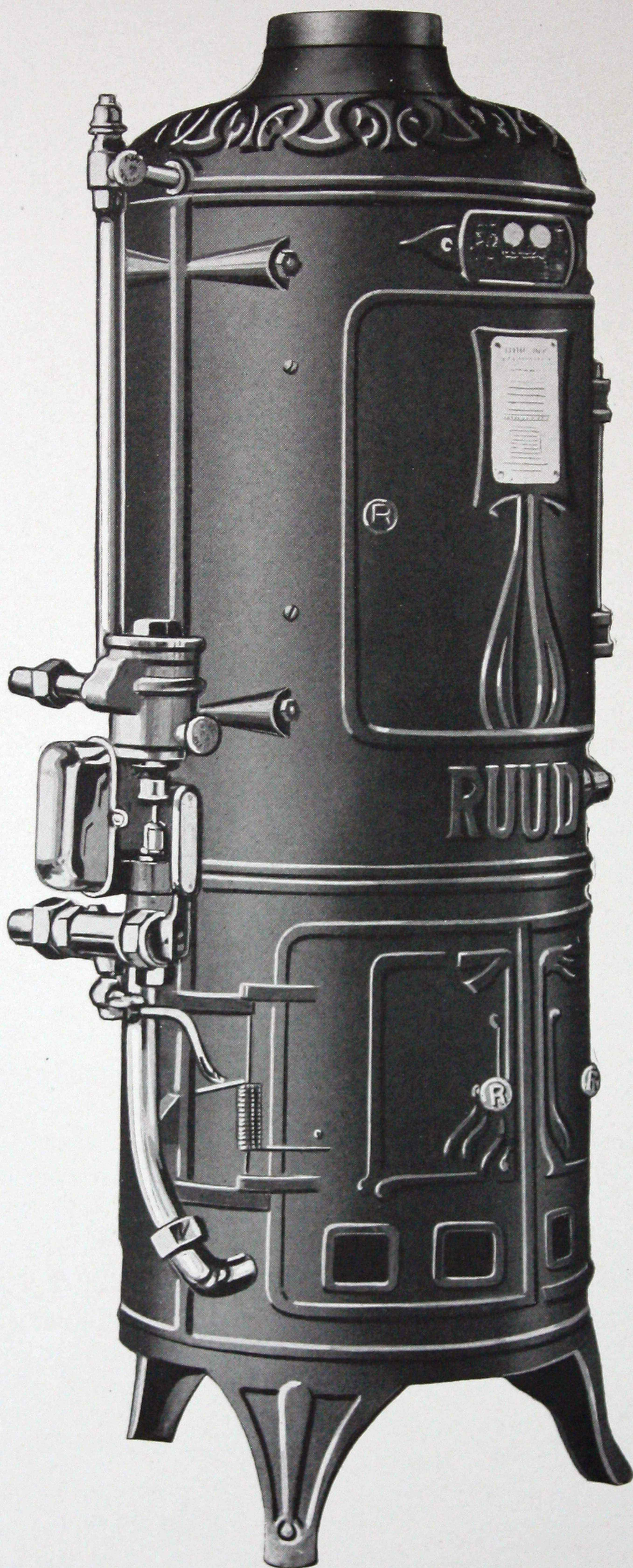
Condensation, commonly called "sweating" of the coils, is a natural result of the combustion of gas. The amount of conden-

sation indicates the efficiency of the installation by showing that sufficient heat is not passing out through the flue to carry the condensation away in the form of vapor. Condensation is collected and drained from the heater by a lead tube in the rear. It may be found desirable to connect this tube to a permanent drain.

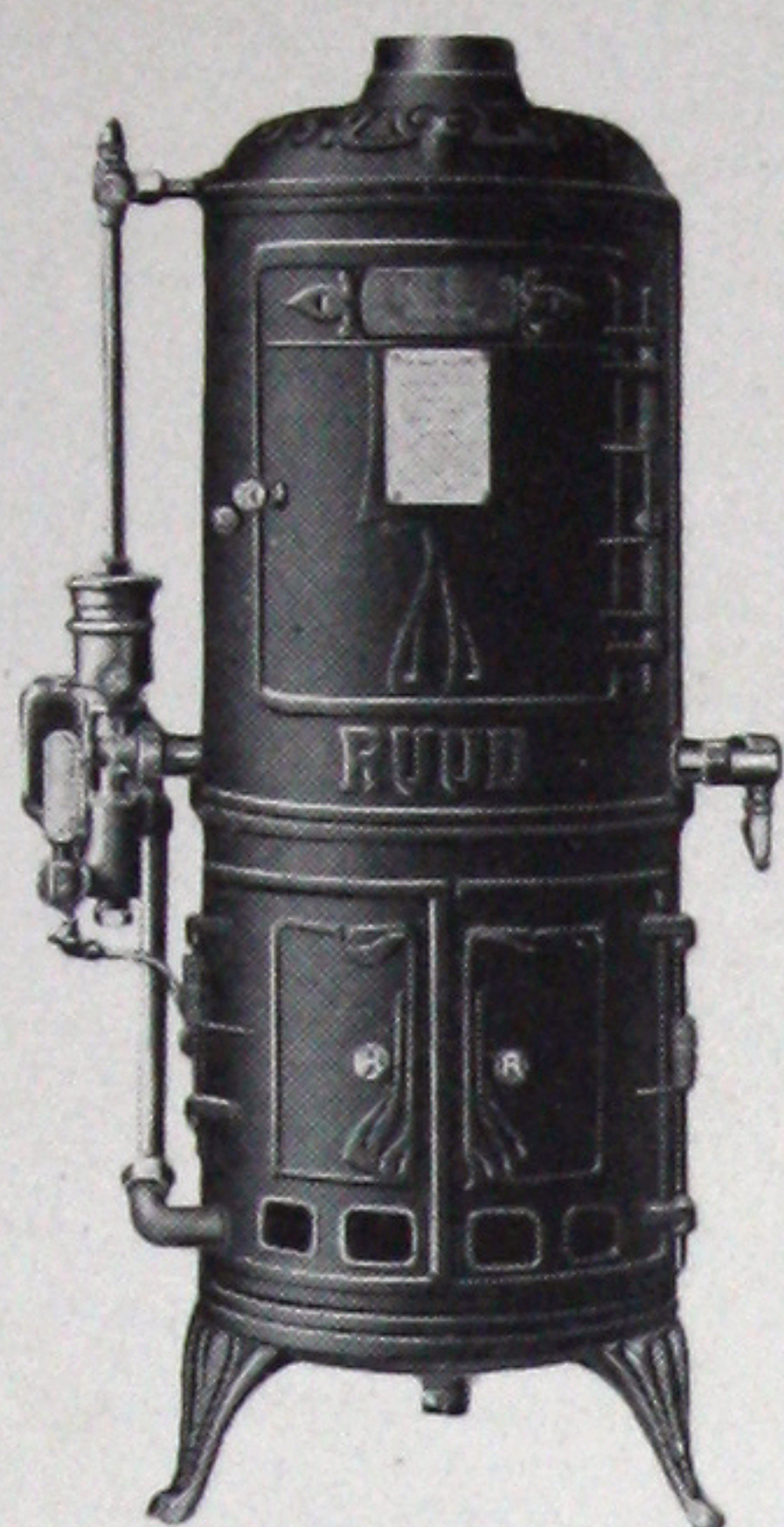
ADJUSTING THE WATER FLOW

Adjust the water flow by means of regulating valve "C" to obtain the desired temperature. Never guess at the amount of water passing through the heater but use a bucket or some convenient measure instead.

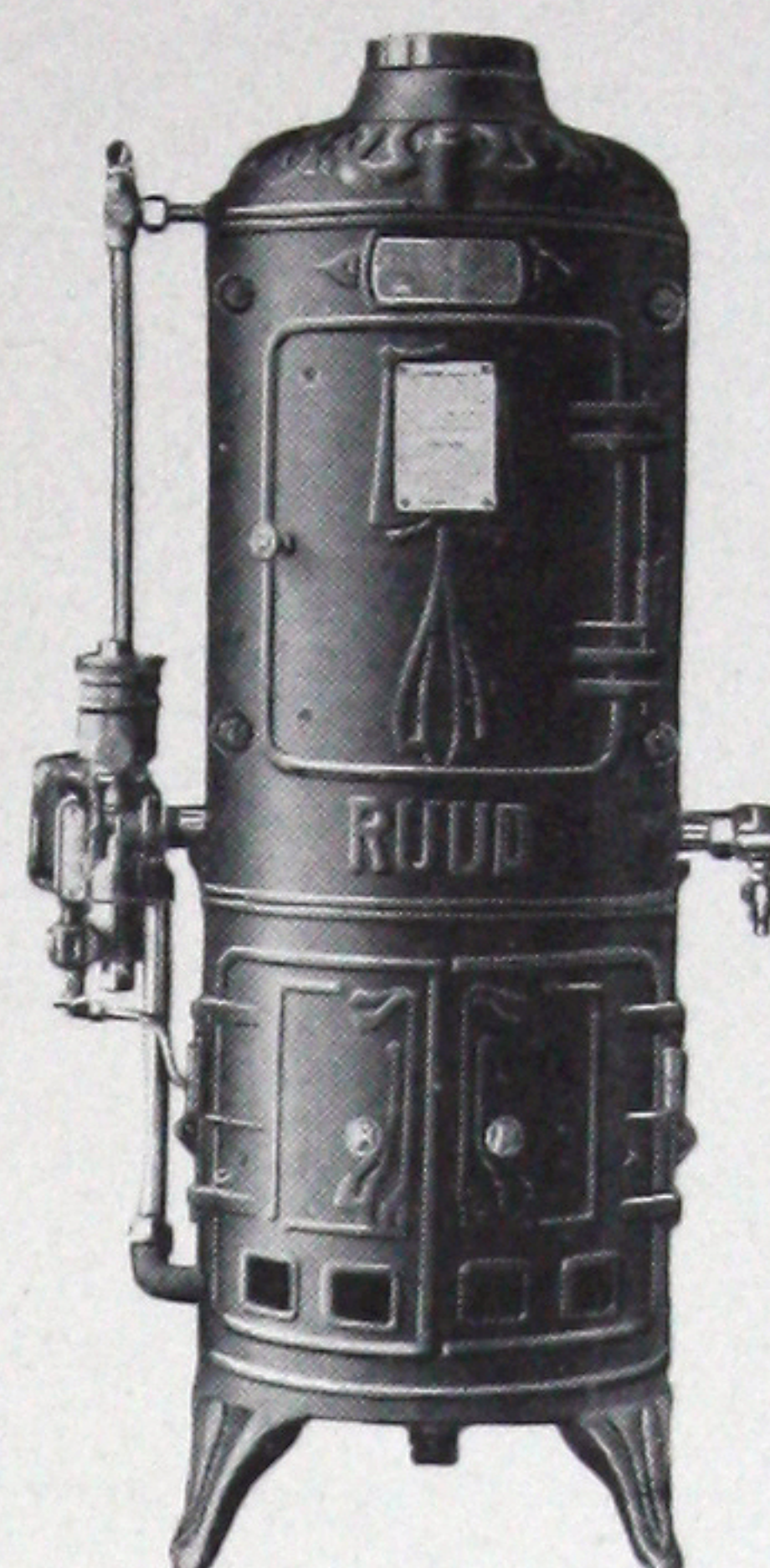
Never run piping where it will interfere with the removal of heater parts.



Ruud Automatic Gas Water Heater for Small Homes
Instantaneous Type
Three-quarter View Showing Automatic Mechanism



No. 85



No. 95

RELATIVE SIZES

Ruud Automatic Gas Water Heaters for Small Homes

Cottage Instantaneous Type

These heaters are of the same general design and construction as the larger instantaneous type heaters, and operate on the same principle.

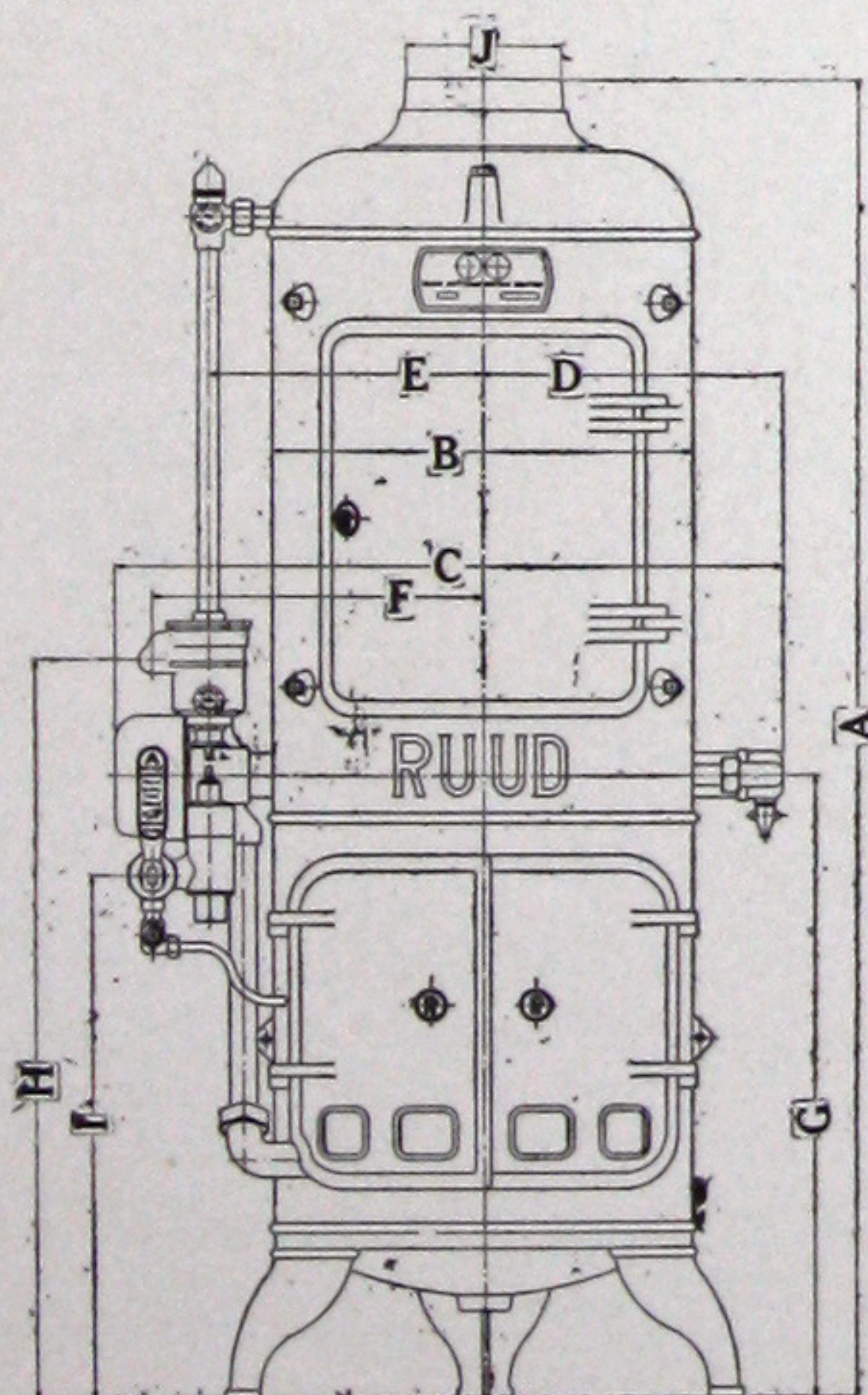
As the name suggests, they are intended for purposes requiring small amounts of hot water through a limited number of fixtures. Small homes and cottages having a compact grouping of fixtures, doctors' and den-

tists' offices, and small apartments are examples.

RUUD Small Home Heaters are extensively used in large apartment buildings, each apartment having its separate heater installed in the kitchen or bathroom. This eliminates the expense of operating a central heating plant during the summer months for the sole purpose of providing hot water.

SELECTION OF SIZE

Size Heater	Capacity per Minute at 63° Temperature Rise	APPLICATION
No. 85	Gallons 2	For very small hot water requirements, where fixtures are compactly grouped, pipe runs are short, and in the case of a residence, where there are but few people in the family.
No. 95	2½	For small hot water requirements where conditions are much the same as above. Ideally meets the needs of the modern small home where fixtures are compact, pipe runs short and where there are but few people in the family.

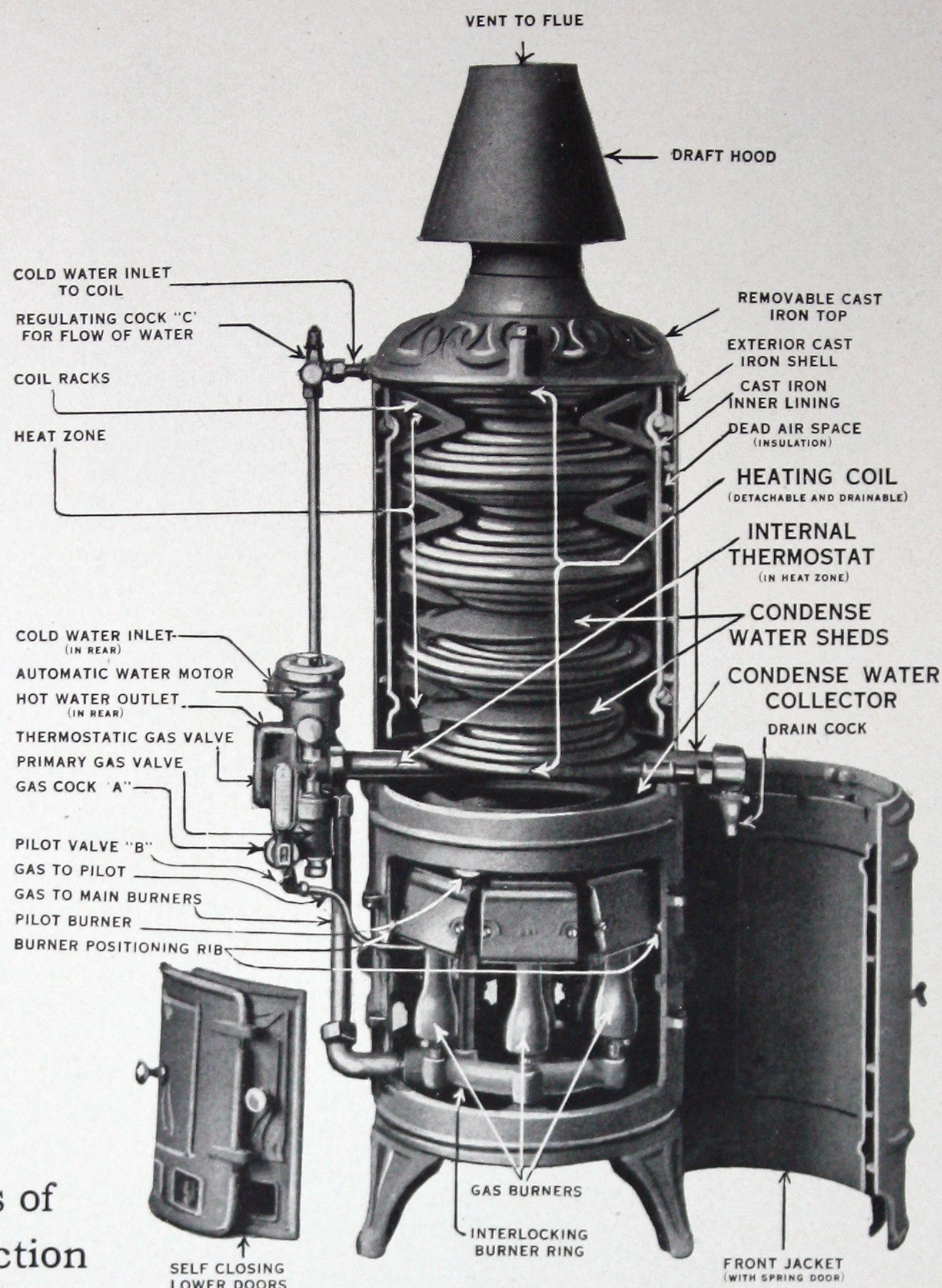


HEATER DIMENSIONS

GENERAL TABLE

Size Heater	Height Over All "A"	Width Over All "C"	Diameter of Shell "B"	Size Water Inlet	Size Water Outlet	Gas Consumed per Minute	
	Inches	Inches	Inches	Inches	Inches	Art.	Nat.
No. 85	39¾	20½	13⅛	½	½	2	1
No. 95	42⅝	21¾	13⅞	½	½	3	1¾

Size Heater	Size Meter	Size Gas Line	Size Flue	Weight Net	Weight Crated
	Lt.	Inches	Inches	Pounds	Pounds
No. 85	10	¾	4	175	205
No. 95	10	¾	5	210	255



General Features of Construction

SHELL

Best grade light gray iron castings. Sectional construction for ease of dismounting and for low maintenance cost. Back section in one piece. Front in two sections, upper section having spring door for easy access to coil. Lower front section has double spring doors giving access to burners. Entire heat zone has cast iron inner lining providing dead air insulation. Shell parts assembled by heavy bolts, as few in number as possible.

COILS

Seamless 18 gauge "Premium" copper tubing, tested to 1,000 pounds per square inch and again to 300 pounds after assembly. Coil sections joined by brazed joints or by detachable couplings when so ordered.

MECHANISM

The famous double gas valve dual fuel control mechanism of the larger instantane-

ous type is used, except that water motor and gas valves are arranged slightly different for compactness.

BURNERS

RUUD standard burners of light gray iron castings, with separable cap and perforated flat brass flame check, all held firmly as a unit by two brass bolts. Mounted on brass spuds with detachable orifice caps. Easily dismounted, no matter how long in service.

CONDENSATION SHEDS AND COLLECTOR

The No. 95 is equipped with two circular cast iron sheds which divert condensation from lower coils to shell liners, then downward to an iron collector ring which carries it to outside of heater. This protection against the evil effects of condensation is an exclusive RUUD feature.

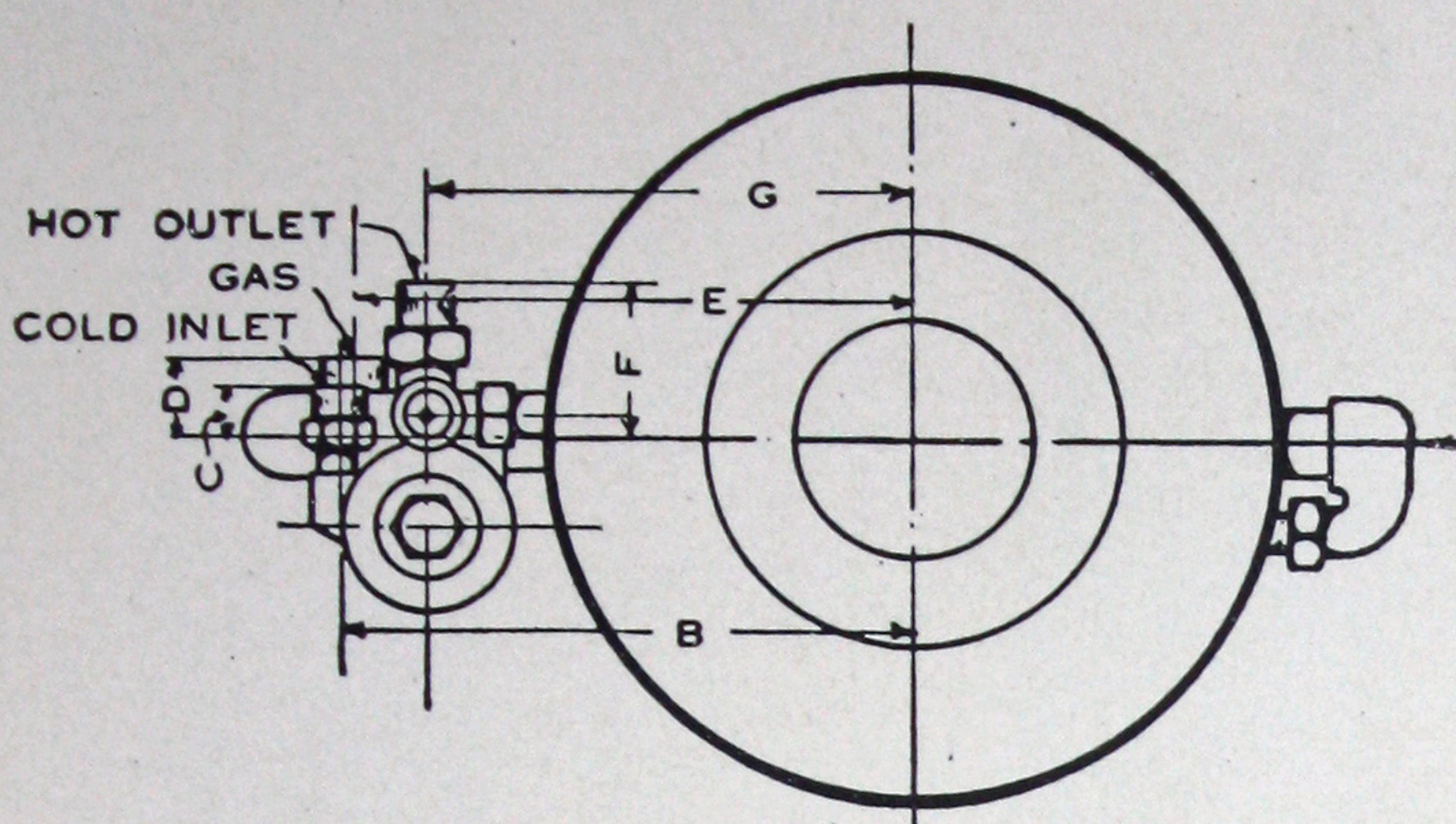
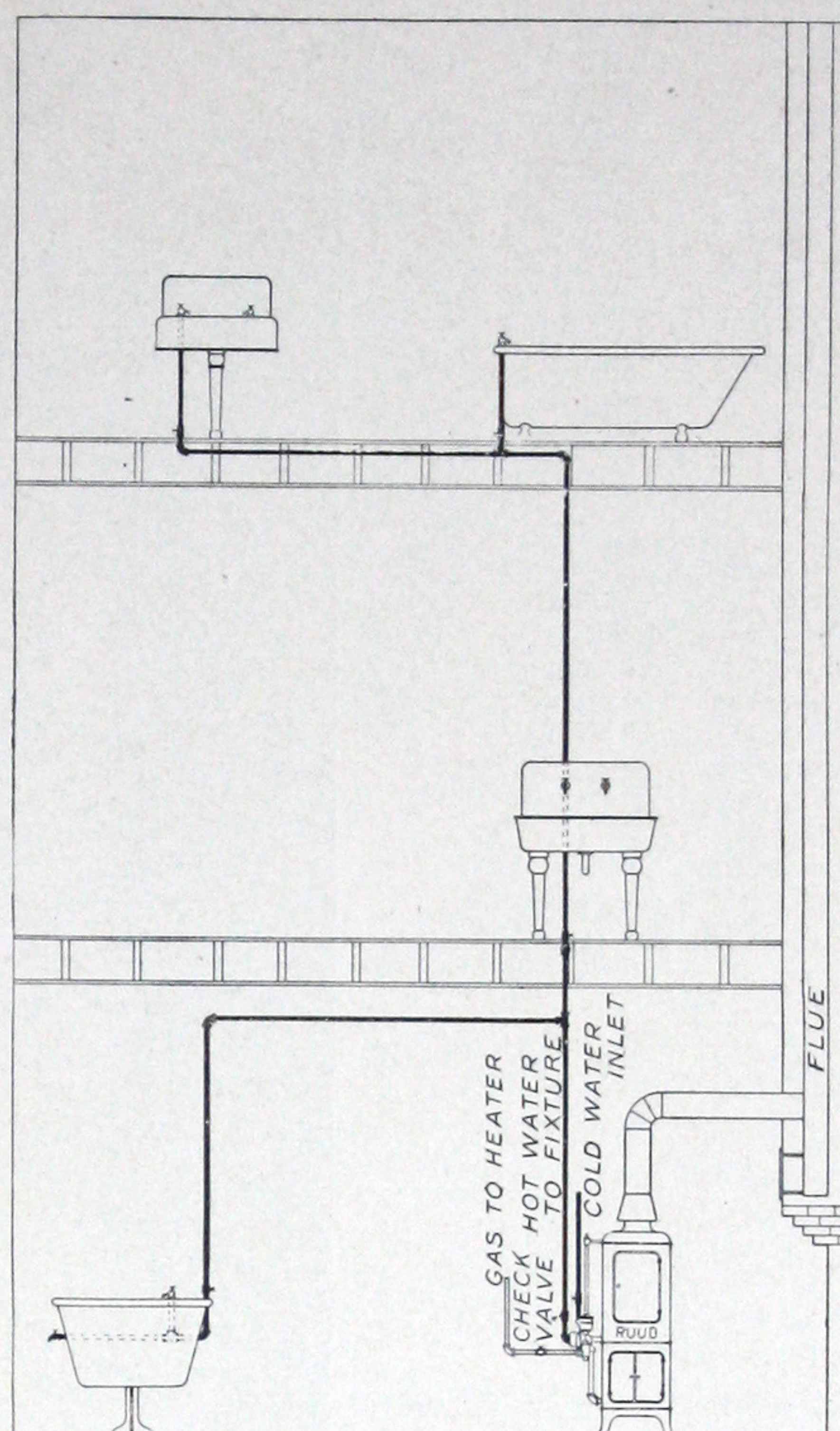


TABLE OF ROUGHING-IN MEASUREMENTS

Size Heater	B	C	D	E	F	G
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
85	$10\frac{5}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$10\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{4}$
95	$10\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$10\frac{3}{4}$	3	$9\frac{1}{4}$



The Ruud (cottage instantaneous type) installed in the basement, where fixtures are compact and the pipe runs short

Installation Information

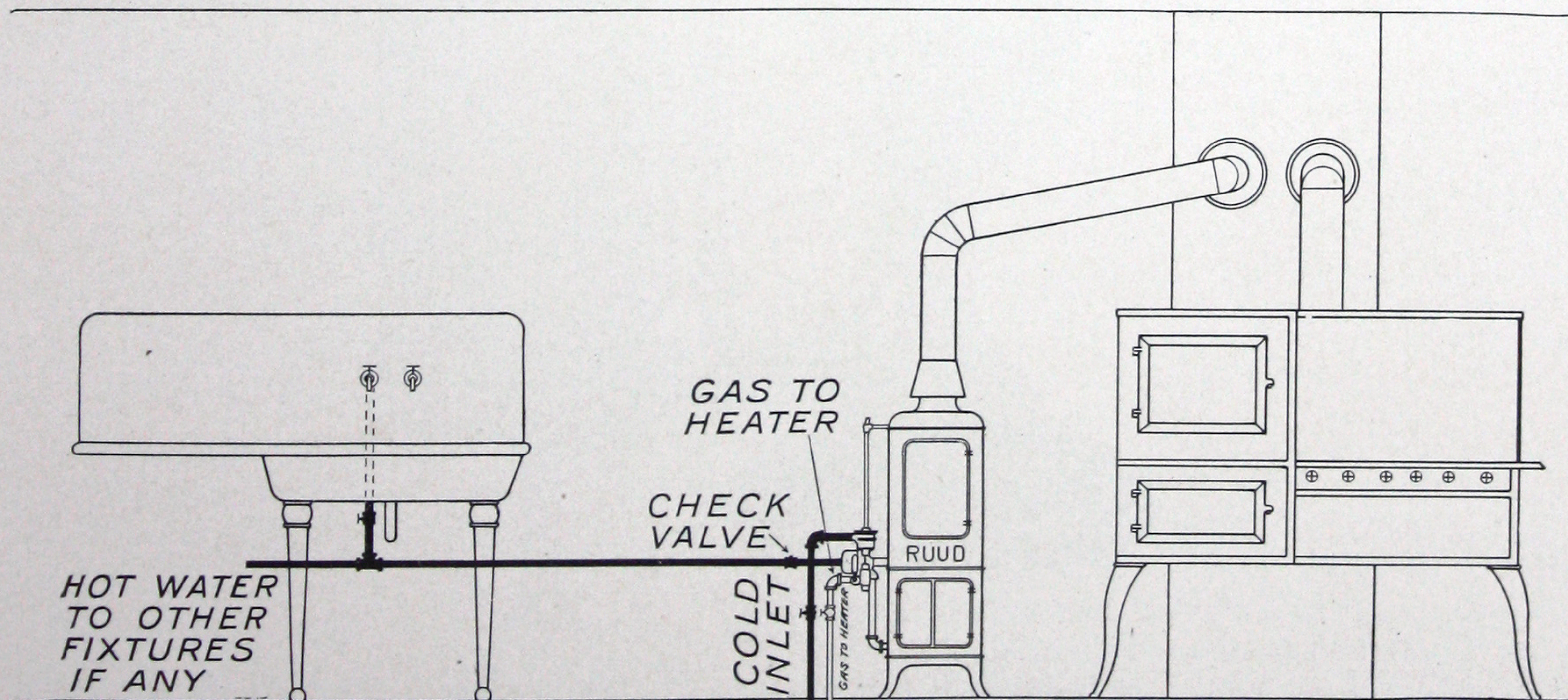
The suggestions on pages 12 and 13 for installation of standard instantaneous type heaters also apply to RUUD No. 85 and 95 Heaters.

A water pressure of at least 25 lbs. at the highest faucet is required to enable these heaters to deliver their capacity at that point.

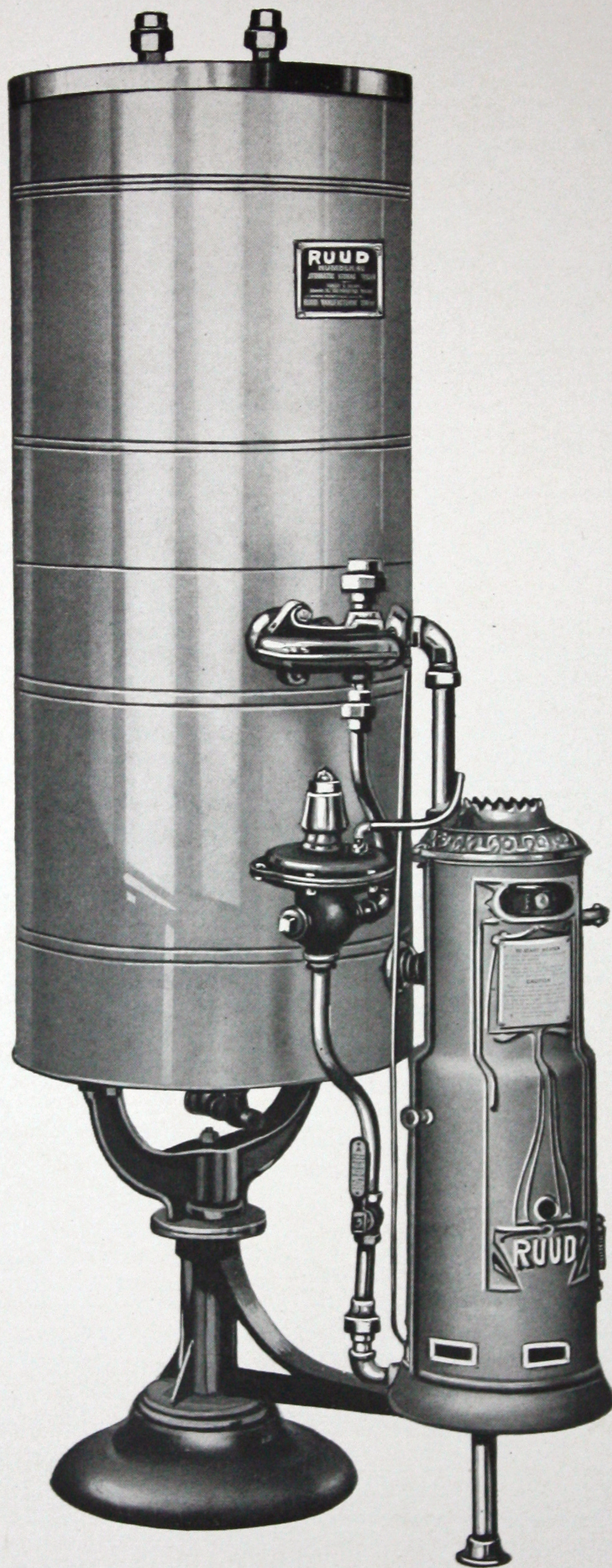
The prospective user should be fully

acquainted with the capacity of these small heaters. The difference in flow between the hot and cold faucets should be clearly explained, also the limited number of faucets that can be supplied at one time.

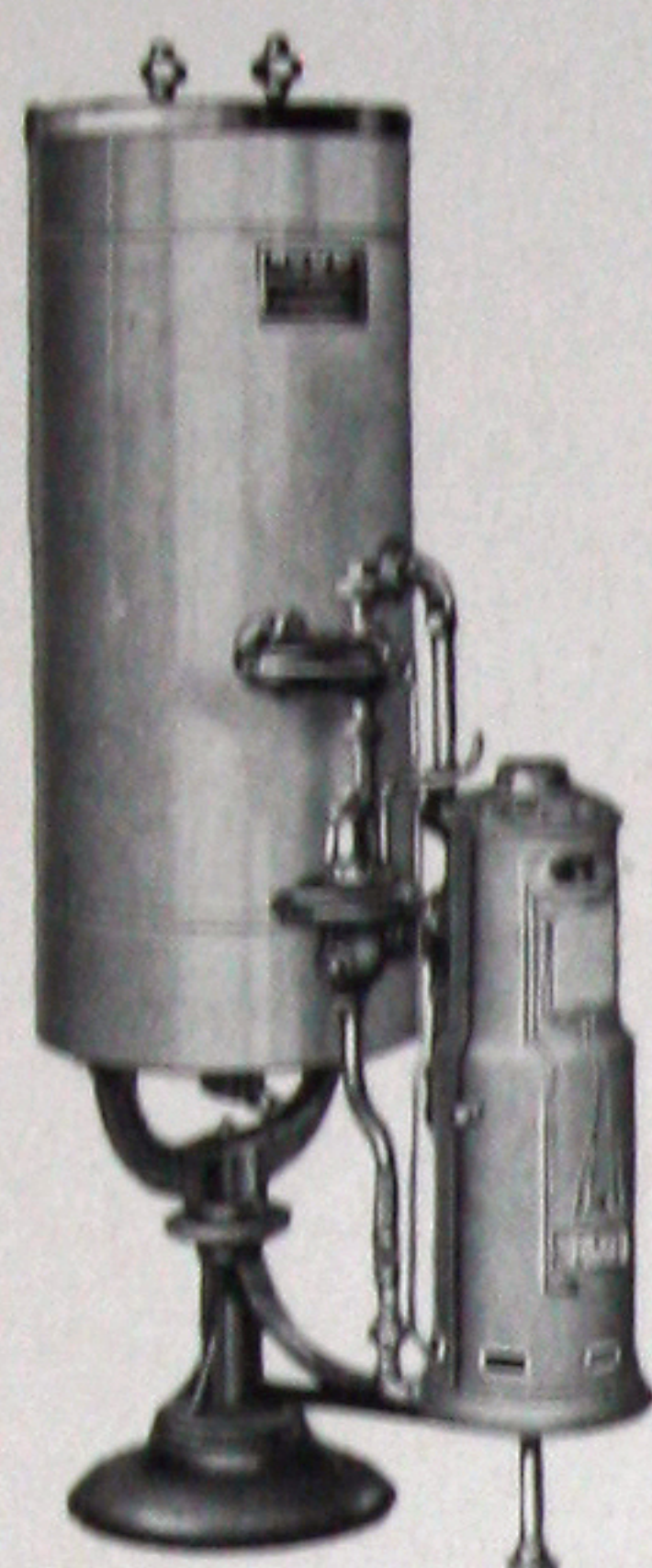
Write the general office or the nearest branch for any information needed in connection with the selection, sale or installation of these heaters.



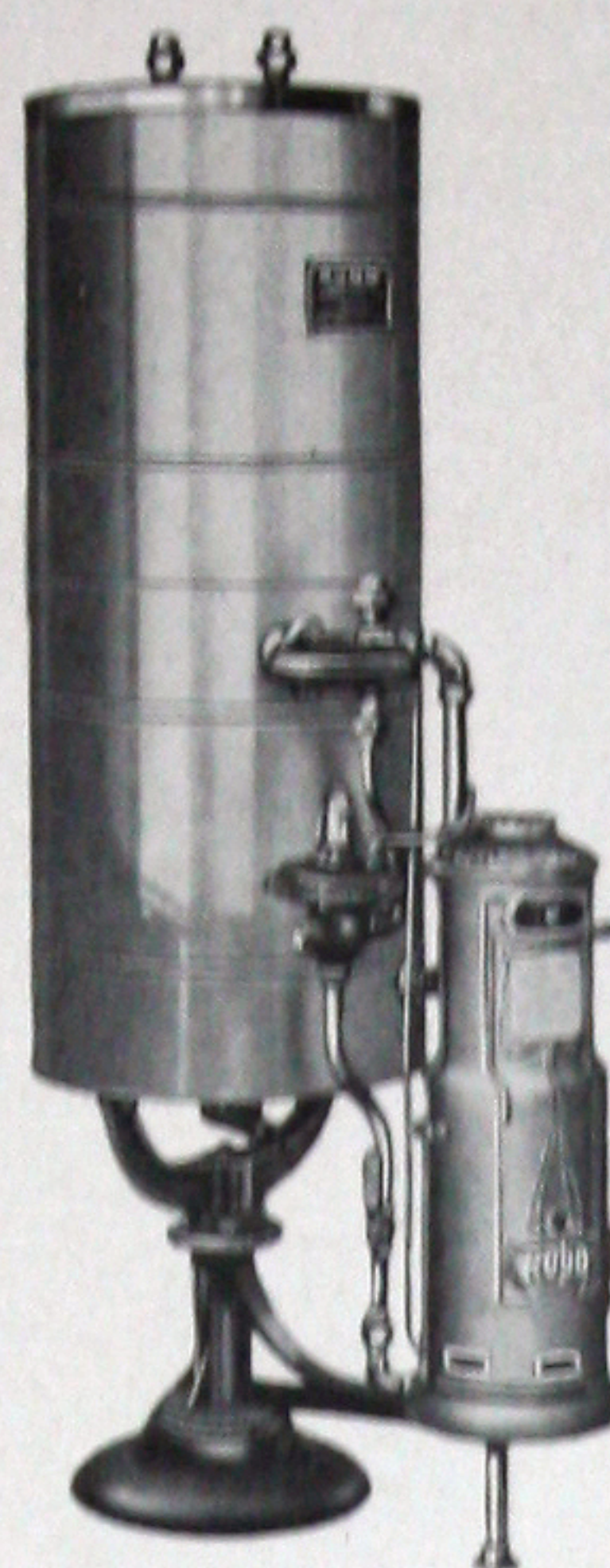
The Ruud (cottage instantaneous type) connected in the kitchen, close to the sink, and supplying hot water to the bathroom when the pipe run is not over twelve feet



Ruud Automatic Storage System
for Domestic Use



No. 30



No. 40



No. 50

RELATIVE SIZES

Ruud Automatic Storage Systems for Domestic Use

The RUUD is self-contained and entirely automatic, being equipped with the famous RUUD All-Metal Thermostatic Moment Valve. The hot water generated by the heater is stored in a tank, from which several faucets may draw simultaneously. Each gives hot water as fast as a cold water faucet flows cold water.

The gas burned is controlled entirely by the temperature of the water in the tank. Cold water, coming into the tank to replace the hot water drawn, lowers the temperature

and the gas is turned on when the change amounts to a few degrees. As soon as the temperature is raised to the desired point the gas valve closes and all gas is shut off.

This type system requires no water pressure in its automatic operation and consequently will function under low pressure conditions. The same is true of the gas pressure. It burns gas at a comparatively slower rate and over longer periods than the instantaneous type.

SELECTION OF SIZE

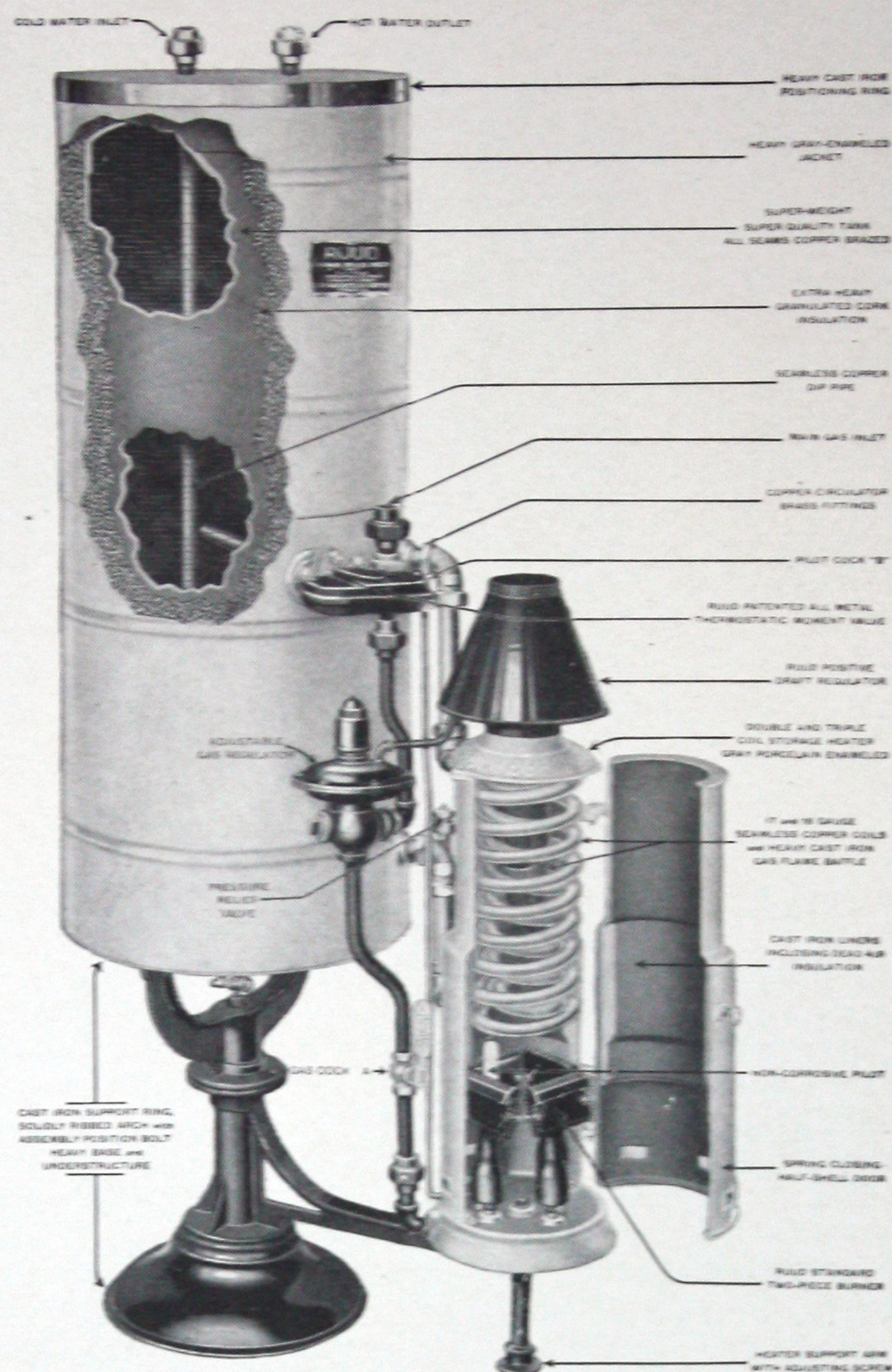
System	Consisting of	APPLICATION
No. 30	No. 30 heater with 24-gal. tank.	For small residences having bathroom, kitchen and laundry; small family.
No. 40	No. 40 heater with 40-gal. tank.	For average residences having private bath, one servant's bathroom, kitchen and laundry connections.
No. 50	No. 50 heater with 66-gal. tank.	For larger residences having two to four bathrooms, one or more bedroom lavatories, kitchen sink and laundry trays.

The proper size storage system is determined, not by the number of faucets that must be supplied at one time, but rather by the total number of gallons of hot water that will be used during the period of heaviest demand.

For example—take a family of five persons. Between 6:30 and 7:30 A. M. the average hot water requirement may be estimated as follows:

Fixture Used	Times	No. Gallons
Tub.....	1.....	20
Lavatory.....	5.....	10
Sink.....	2.....	8
Total number of gallons used.....		38

A No. 40 System, which provides a supply of 40 gallons of hot water ready for instant use would be suitable in this case. Usually, considerable time elapses before there is another demand as heavy, and in the meantime the heater will have had ample time to renew the supply of hot water in the tank.



General Features of Construction

HEATER

Shell of heavy cast iron with cast iron liner, which provides dead air space insulation. Front half of shell is self closing spring door, making coils and burners easily accessible.

COILS

Only 17 and 18-gauge "Premium" copper tubing (over 99% pure) is used for the coils. Tested to 1,000 pounds pressure before coiling and to 300 pounds after assembly. All coils independent and detachable and joined by heavy brass manifolds outside of heater and heat zone. Ground joint couplings used—no brazed joints.

BURNERS

Burners are cast iron (Bunsen type) and of special flash-proof design. Made in two pieces with perforated flat brass flame check between. Mounted on brass spuds having detachable orifices. Easily removed and dismantled for inspection and cleaning, no matter how long in service.

PILOT

Non-corrosive pilot burner is used—consumes less than a cubic foot of gas per hour.

GAS REGULATOR

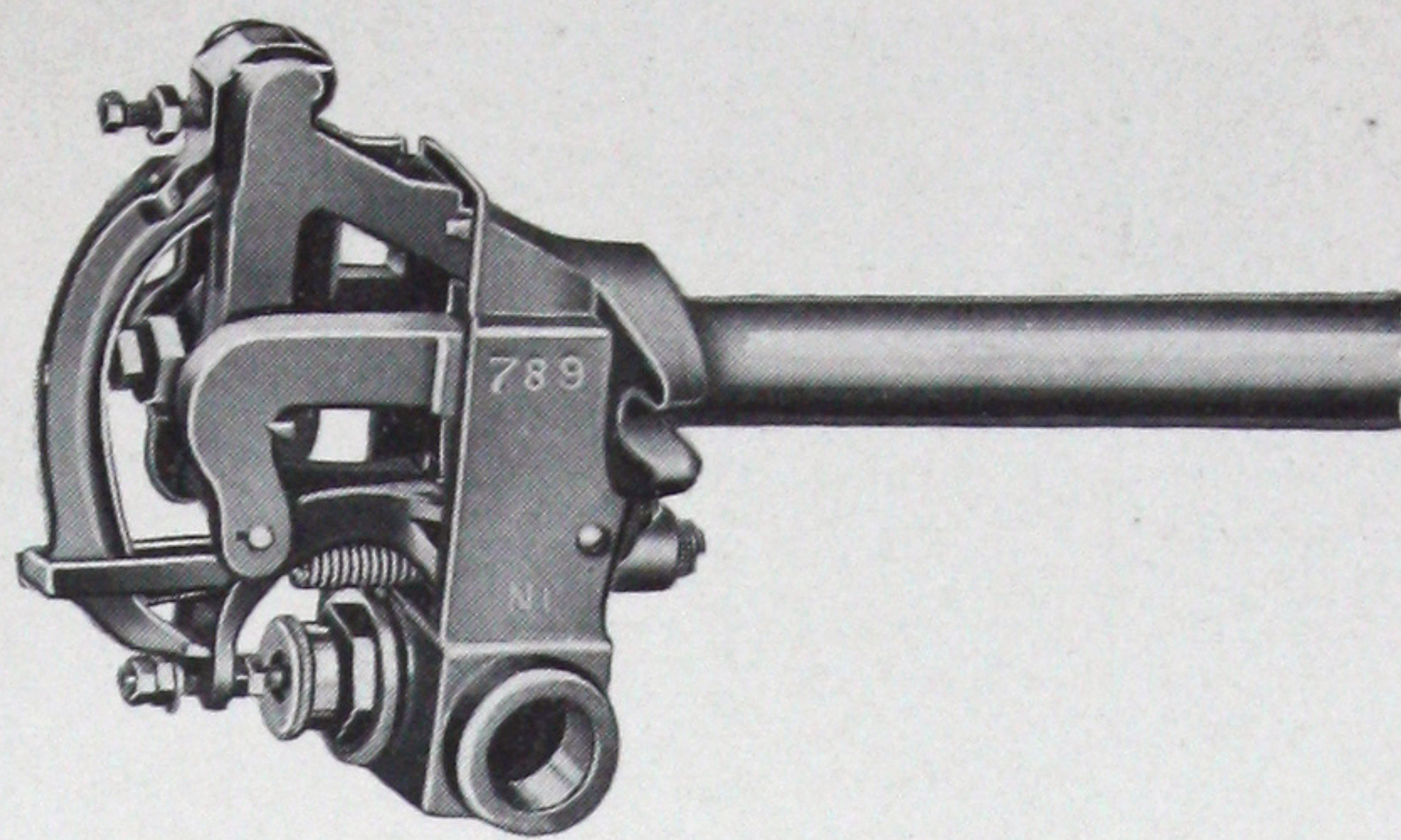
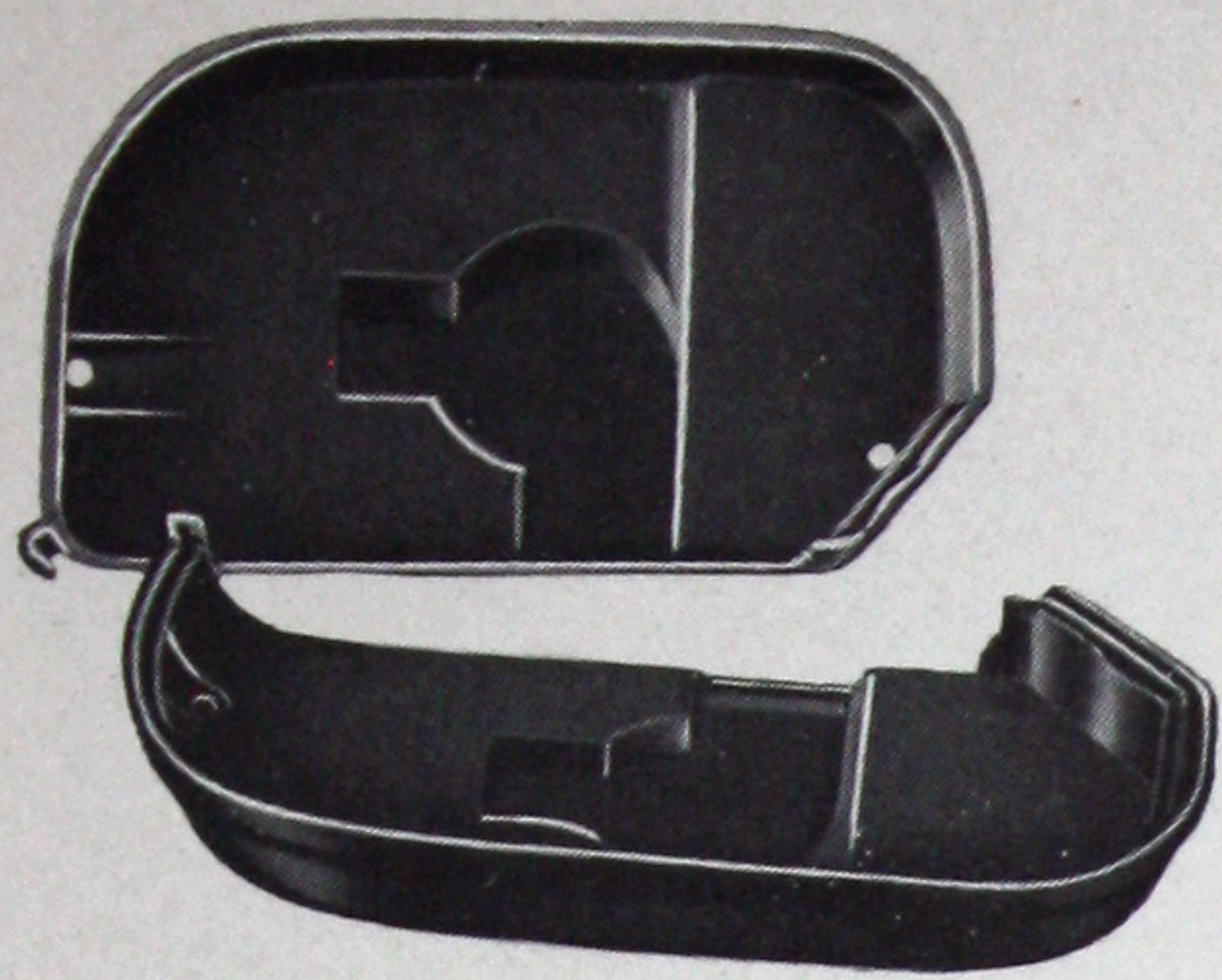
Positive gas regulator which insures burners against excessive gas pressure is standard equipment with every system.

FINISH

Heater is finished with two coats of high temperature porcelain enamel. Tank is finished with two coats of air-drying enamel.

INSULATION

Tank is insulated by a layer of granulated cork $1\frac{3}{8}$ -inch thick, held in position by an outer sheet iron jacket. Insulation is so nearly perfect that the tank will keep water hot over a period of sixteen hours without any gas being burned, if no hot water is drawn in the meantime.



Ruud All-Metal Thermostatic Moment Valve—Used with Natural and Artificial Gas Systems

Ruud All-Metal Thermostatic Moment Valve

The mechanism used on RUUD Storage Systems insures a positive control of the gas at all times and the highest possible operating efficiency. It has never been equalled or approached for quality, dependability and service. Hundreds have been in constant service for over fifteen years without adjustment or repair.

HEAT WASTED WITH ORDINARY THERMOSTATS

Previous to the development of the RUUD Moment Valve, water heaters of the storage type were not practical owing to the amount of fuel wasted by so-called "chimney losses."

In the operation of any storage water heater a certain portion of the heat generated is required to maintain the chimney draft and to keep the heater itself at its operating temperature. Any heat in excess of this amount is available for heating water. Consequently, if a heater is permitted to burn with too low a flame the heat will be wasted.

With ordinary thermostats the gas valve is never completely at rest and practically never closed tight. The result is a low, lingering flame at the burner which may burn over long periods and do little or no effective work.

OPERATION OF THE RUUD MOMENT VALVE

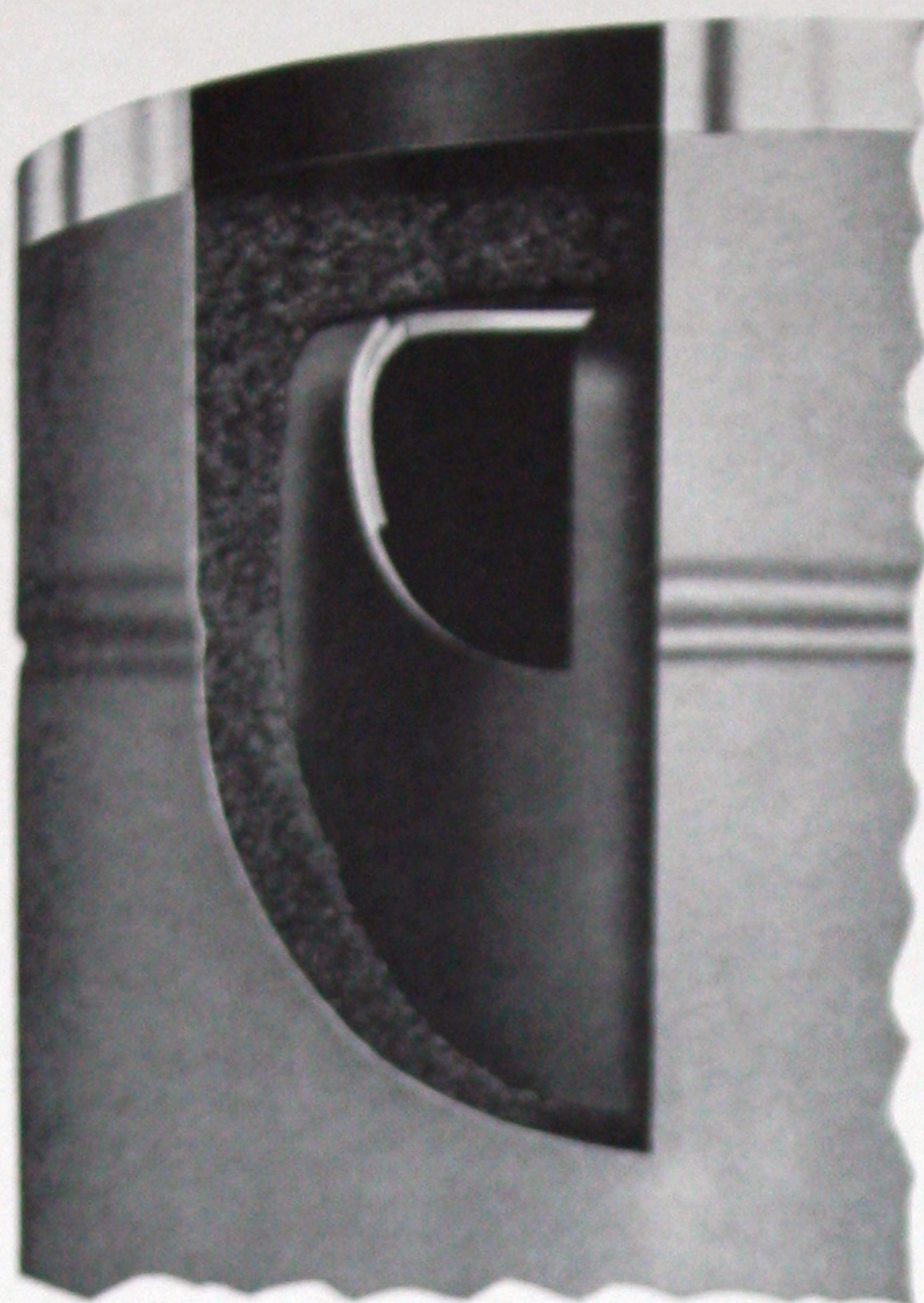
The RUUD Moment Valve operates with a positive "hammer-blow" snap action. There are no midway positions of the gas valve seat—the gas is always burning full or completely closed off.

When sufficient hot water is withdrawn from the tank to lower the temperature about 25 degrees the Moment Valve instantly opens, giving a full flame at the burners; the highest operating efficiency. When the water reaches the temperature for which the Moment Valve is set (150° F.), another positive movement shuts the gas completely off. This full-fuel principle prevents burner trouble which so frequently accompanies low-flame operation, and completely eliminates flue losses during periods when the system is not burning.

Straight graduating thermostats are still used where natural gas is plentiful and cheap, but we always recommend the RUUD Moment Valve.

DEPENDABILITY

The RUUD Moment Valve is made of copper and brass—termed the "everlasting" metals, because they are not affected by corrosion or deterioration. There are no delicate parts to wear out of adjustment. No RUUD Moment Valve has ever failed in service unless tampered with, or injured by fire or other violence.



Sectional View
Showing Insulation

Ruud Super-Weight Storage Tanks

The terms "standard," "extra heavy" and "double extra heavy" as applied to commercial hot water tanks are familiar; in fact, the weight of a tank is quite generally accepted as a measure of its quality and length of life.

The RUUD is a super-weight tank—it averages 50% heavier than "extra heavy" tanks. The following table shows an interesting comparison of the RUUD with ordinary commercial tanks and illustrates clearly the marked superiority of our construction.

Size in Gallons	Weight of "Standard" Tank	Weight of "Extra Heavy" Tank	Weight of Double "Extra Heavy" Tank	Weight of RUUD TANK
24	62 lbs.	78 lbs.	98 lbs.	129 lbs.
40	95	120	130	170
66	160	185	200	250

*Two tanks of a given size will not weigh the same, due to unavoidable percentage of difference allowed the metal manufacturers. The table here given is based on averages. Differences, however, will be less than five per cent.

SEAMS

All seams are brazed with copper spelter at 2,000 degrees F. The molten copper finds its way into the most minute cracks and crevices, resulting in a joint that is stronger than the plate itself and a seam that is corrosion-proof. Rivets are used only to hold the plates in position for brazing. Every tank is tested to 250 lbs. water pressure.

PLATE

Best quality 3/16-inch steel plate is used. Plates are heavily galvanized inside and out. Heads are 1/4-inch flanged galvanized steel. The combination of unusual weight metal and copper brazed seams results in a super-quality tank.

HEATER AND TANK SEPARATE

RUUD design separates the heater from the tank, consequently the tank is not subjected to the destructive action of the hot gases which often contain corrosive sulphur compounds. Where the heating surface is a part of the tank, a large amount of heat is carried away by the draft when the gas is turned off—in reality the heating surface becomes a cooling surface. The RUUD wastes no heat in this way because its heater and flue are not an integral part of the tank and the stored water is not subjected to chilling flue drafts.

Copper Tanks for Ruud Automatic Storage Systems

In districts where the water is of a nature that is destructive to galvanized iron tanks, we recommend that copper tanks be used.

RUUD Copper Tanks of a quality equal

to our galvanized tanks can be furnished where desired. Our knowledge of water conditions throughout the country is at your disposal.

GENERAL TABLE RUUD AUTOMATIC STORAGE SYSTEMS

No. of System	Tank Capacity	Coil	Height Over All "A"	Width Over All "B"	Diameter Tank With Covering "E"	Size Flue	Size Circulators	Cold Water Inlet	Hot Water Outlet	Gas Supply	Size Meter	Weight Net	Weight Crated
No. 30	Gallons 24	Double	Inches 66	Inches 30	Inches 17	Inches 3	Inches 1	Inches $\frac{3}{4}$	Inches $\frac{3}{4}$	Inches $\frac{3}{4}$	Lt. 10	Pounds 307	Pounds 403
No. 40	40	Double	72	31½	19	4	1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	10	355	460
No. 50	66	Triple	77	34¼	23	4	1¼	1	1	$\frac{3}{4}$	10	495	695

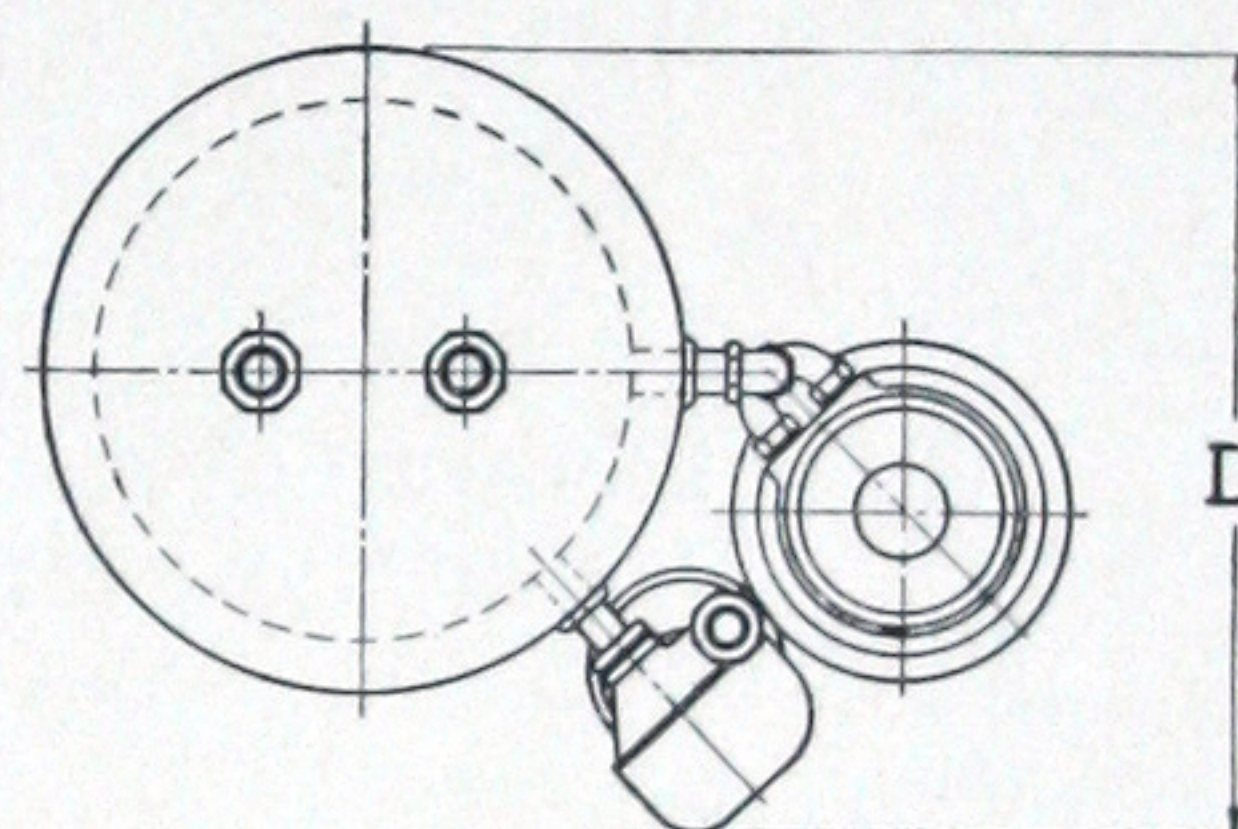
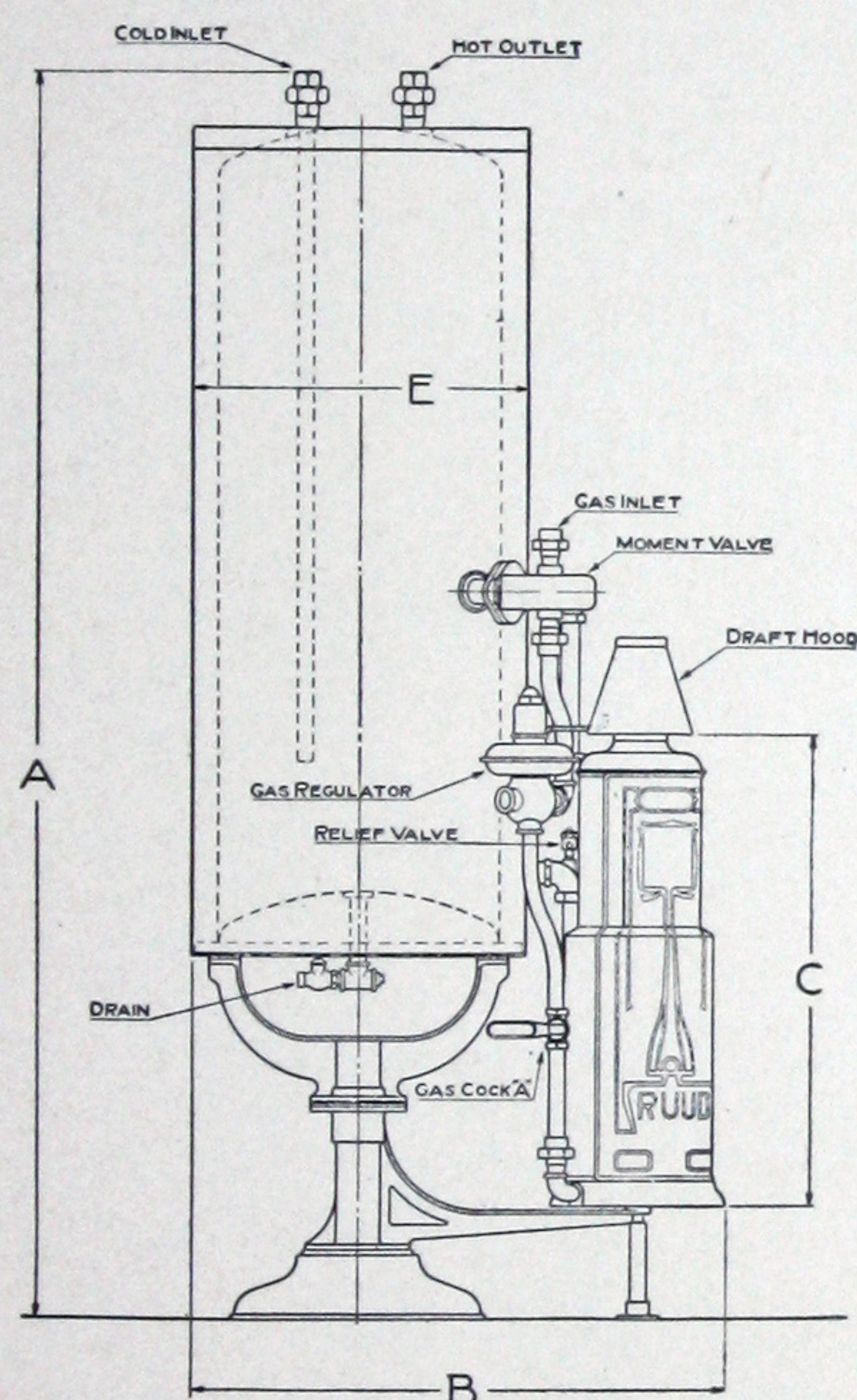


TABLE OF DIMENSIONS

Heater No.	A	B	C	D	E
30	Inches 66	Inches 30	Inches 27¼	Inches 24	Inches 17
40	72	31½	27¼	25	19
50	77	34¼	33½	32	23

Installation Information

LOCATION OF SYSTEM

The suggestions on page 12 regarding the location of instantaneous type heaters also apply to RUUD Automatic Storage Systems.

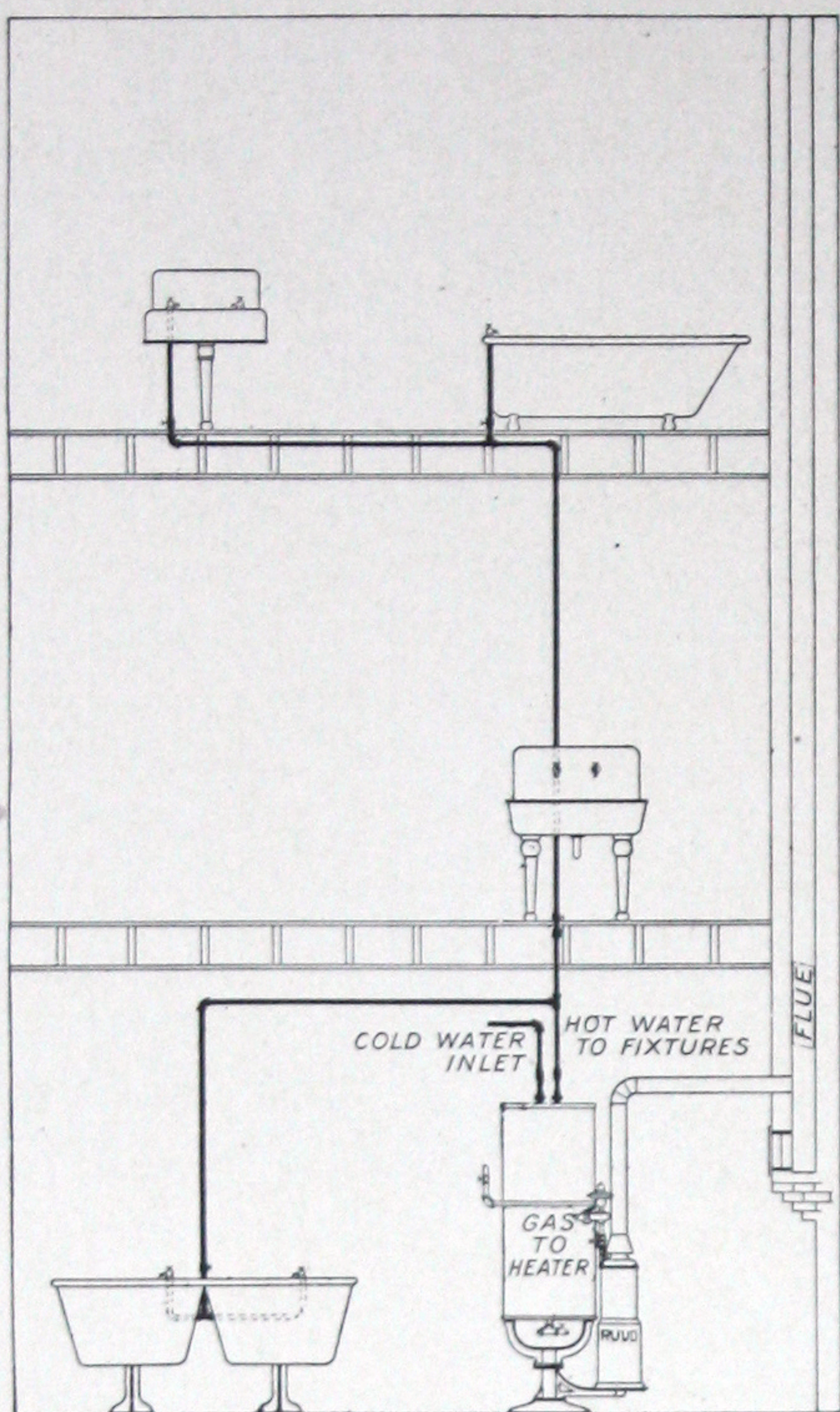
WATER AND GAS CONNECTIONS

Water connections such as are usually run to ordinary non-automatic boiler systems are satisfactory. An ample gas supply is easily secured since the RUUD Automatic Storage System does not require large service lines or high gas pressure.

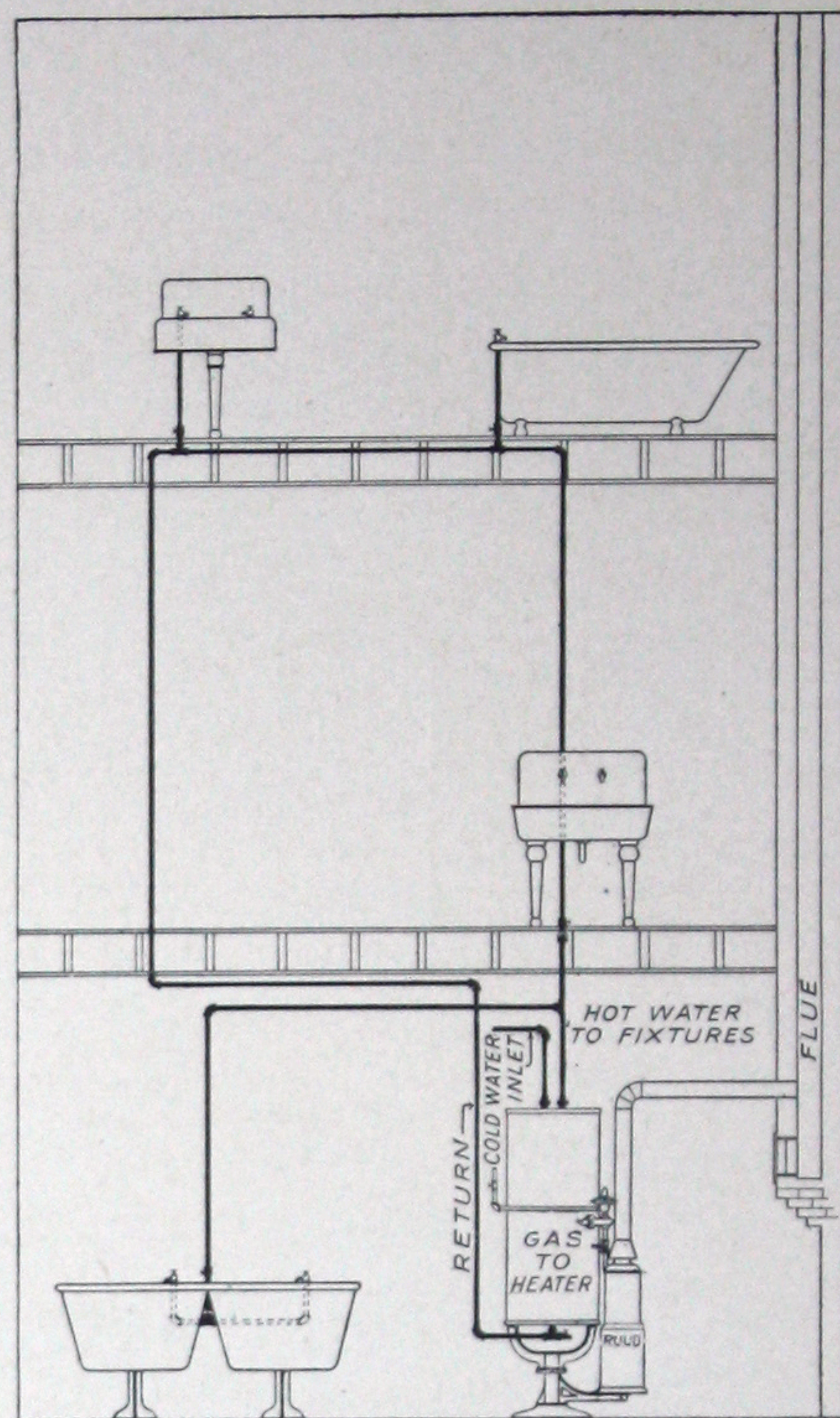
FLUE CONNECTION

The storage system must be connected to a flue having a good draft. Avoid long flat runs of flue pipe and never reduce the size. The RUUD draft hood should always be used and must be placed in a vertical position. It prevents down drafts from entering the heater.

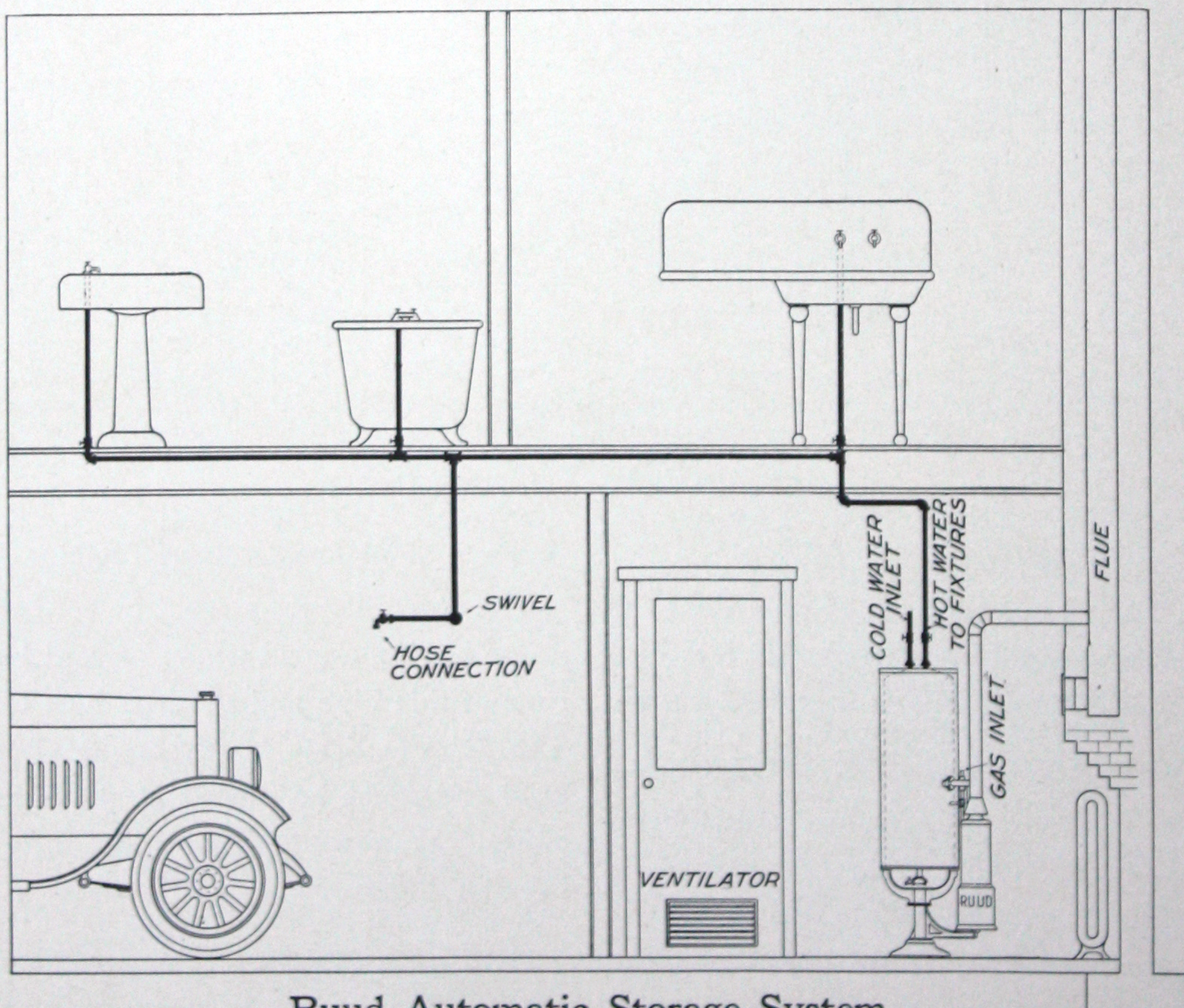
NOTE—A check valve or air chamber as specified for the instantaneous type heater is not required with storage systems.



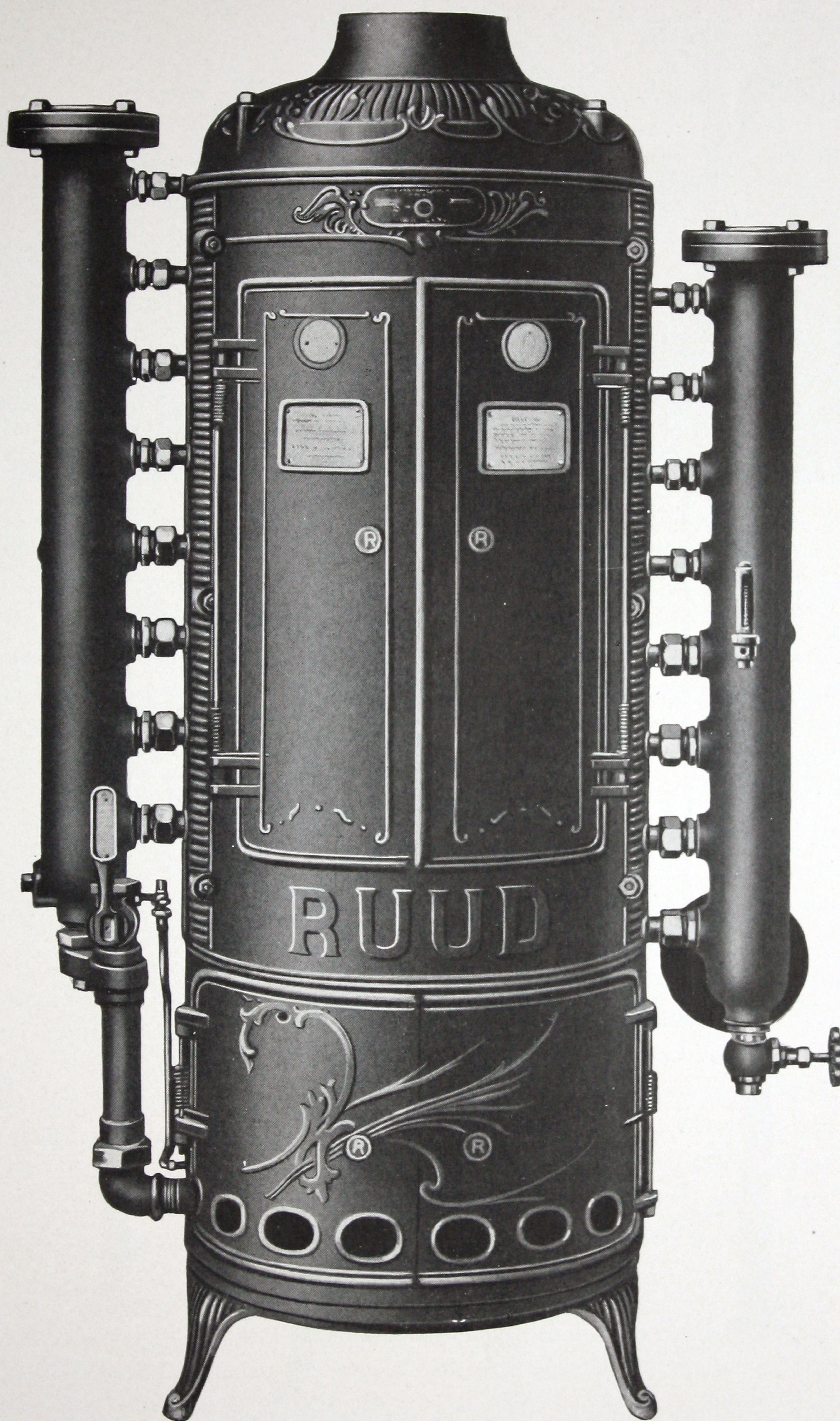
Ruud Automatic Storage System installed on direct system of plumbing



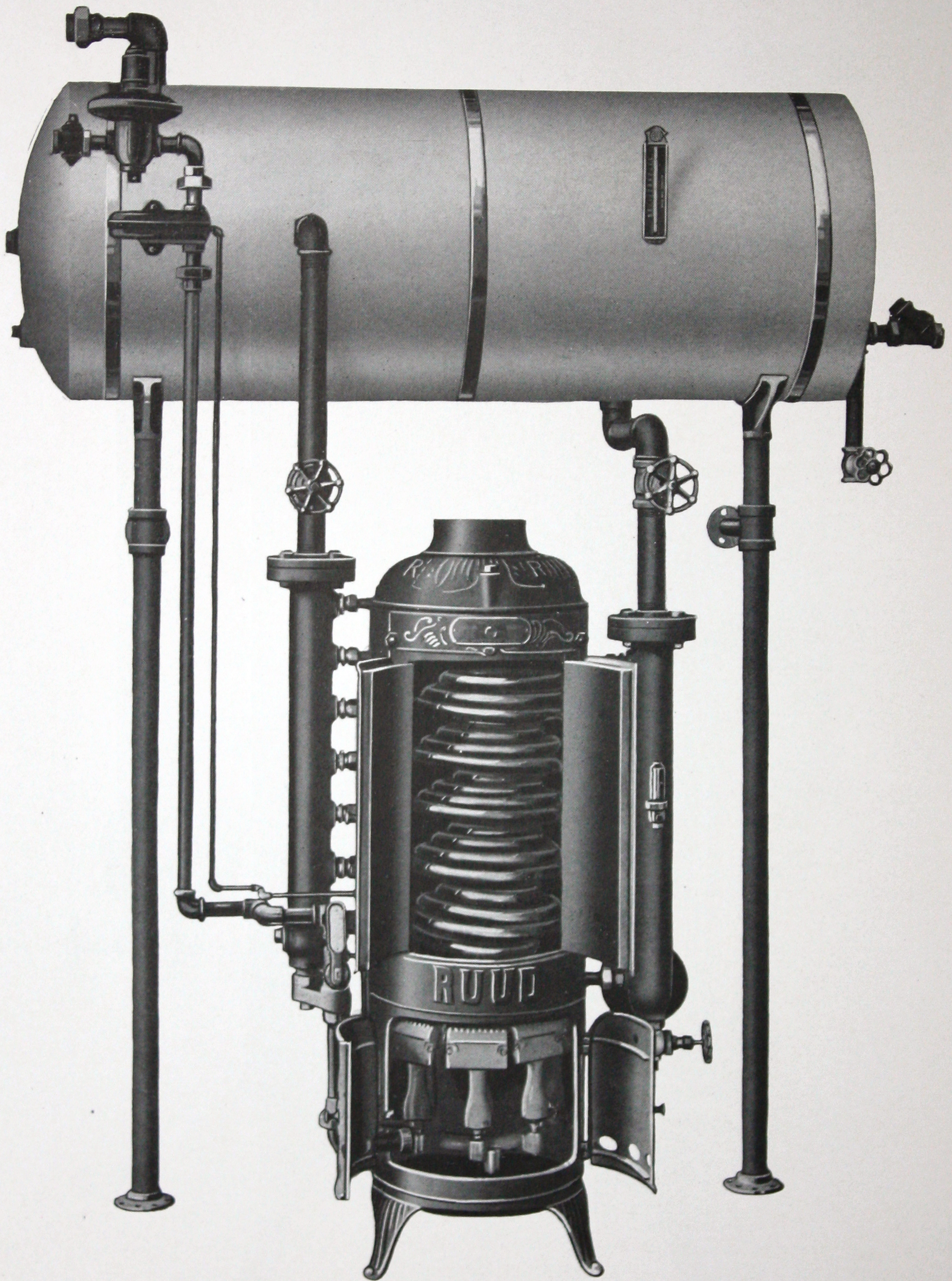
Ruud Automatic Storage System installed on return circulation system of plumbing



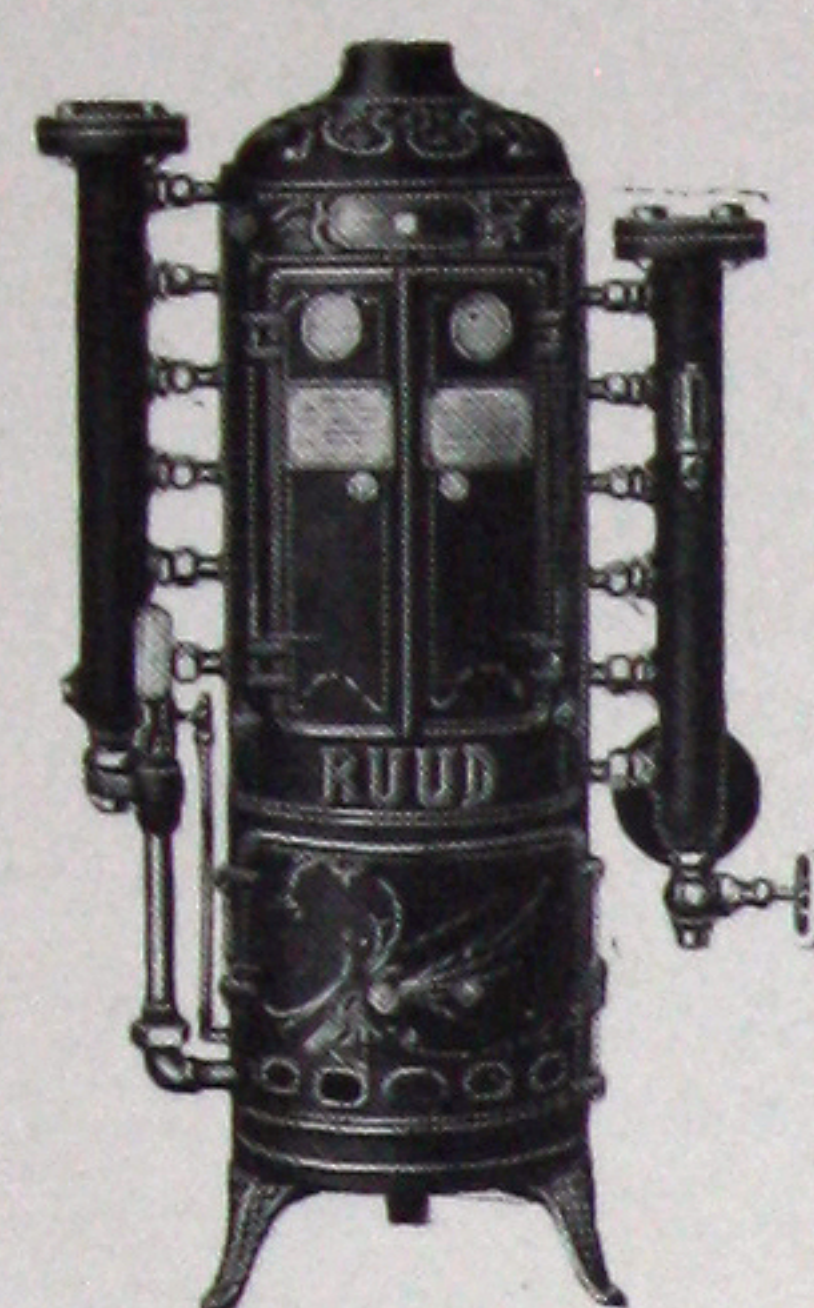
Ruud Automatic Storage System
Installed in private garage for car washing and chauffeur's apartment



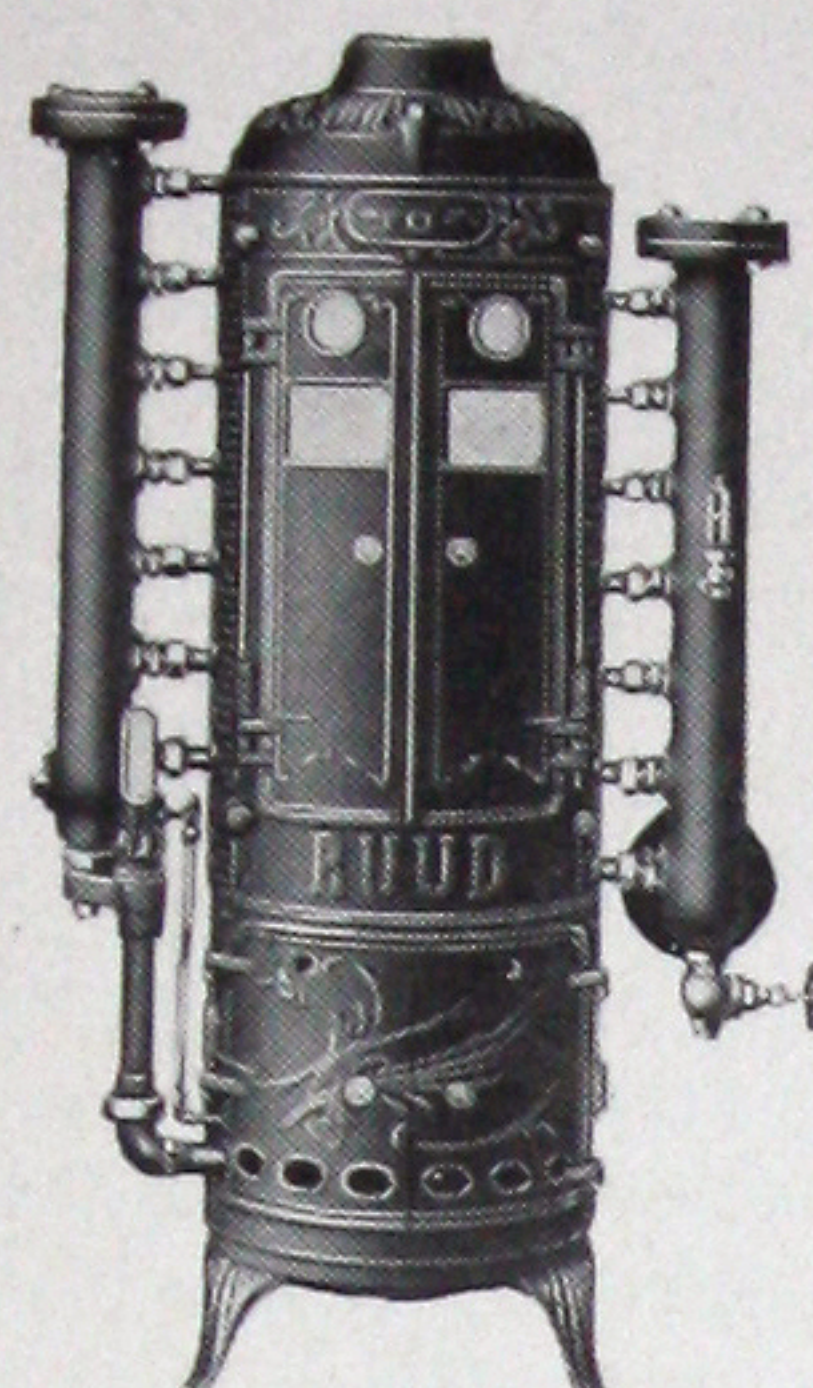
Ruud Multi-Coil Storage Heater



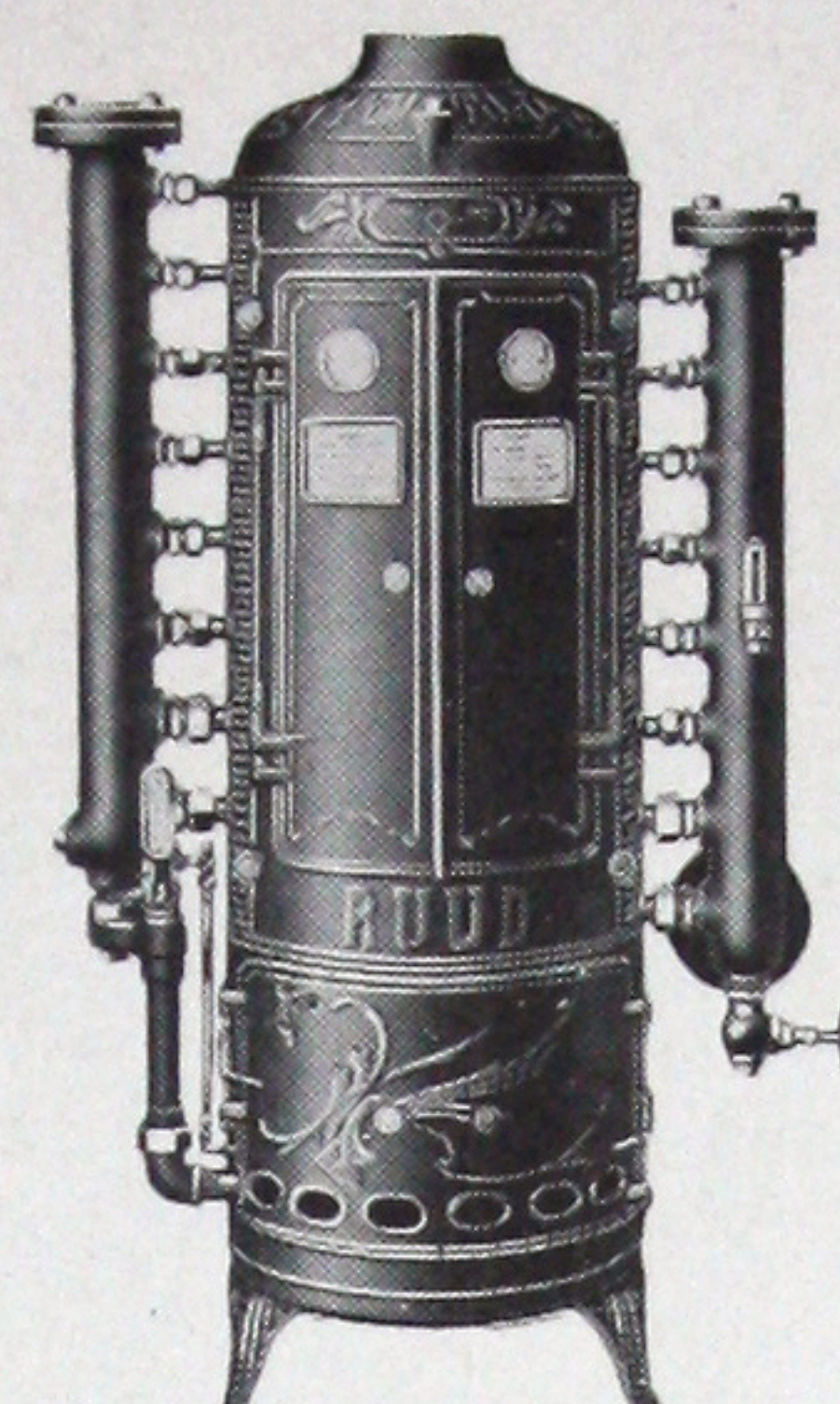
Ruud Multi-Coil Automatic Storage System, Assembled Complete



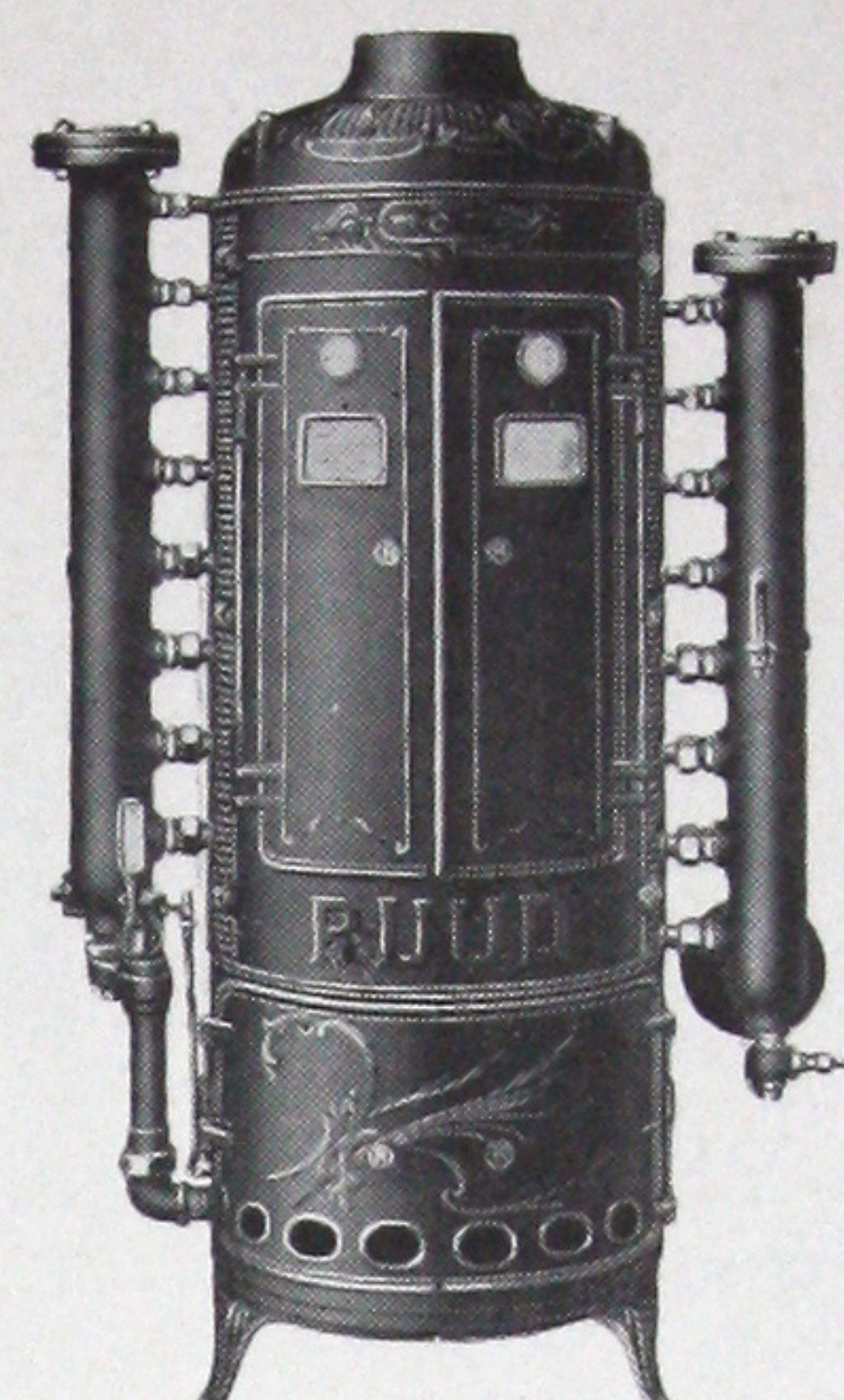
No. 100



No. 200



No. 300



No. 500

RELATIVE SIZES

Ruud Multi-Coil Automatic Storage Systems

The RUUD Multi-Coil Automatic Storage System is designed for conditions requiring a large supply of hot water at several faucets at one time. It permits every hot water faucet to flow as fast as the corresponding cold water faucets, and is suitable for large residences, apartment houses, small hotels, office buildings, hospitals, bath houses, schools, gymnasiums, restaurants, factories, etc.

It is often used in apartment houses and institutions having a hot water supply tank heated in winter by steam coils. Used as an auxiliary under such conditions, the Multi-Coil System with the RUUD Moment Valve adds sufficient heat to keep the tank full of hot water when the heating plant is in partial operation. In summer, when the heating plant is closed down altogether, the RUUD renders perfect hot water service.

The hot water furnished by the heater is

stored in a tank. The gas burned is controlled automatically by the temperature of the water in the tank by means of the RUUD All-Metal Thermostatic Moment Valve described on page 21 (the RUUD Graduating Thermostat is sometimes used with low priced natural gas). Gas is burned only when the temperature of the water in the tank is below the moment valve setting.

This system is especially adapted to low water pressure conditions—the same may be said of the gas supply because it burns gas at a relatively slow rate and over longer periods than the instantaneous type heater.

The complete system consists of Heater, Tank, Moment Valve (or Graduating Thermostat), Thermometer, Gas Regulator, Tank Supports and Magnesia Insulation. Supports are not furnished with tanks larger than 500 gallons capacity.

SELECTION OF SIZE

The basis for determining the proper size Multi-Coil Storage System for any given condition is the **TOTAL NUMBER OF GALLONS OF HOT WATER USED DURING THE PERIOD OF HEAVIEST DEMAND.**

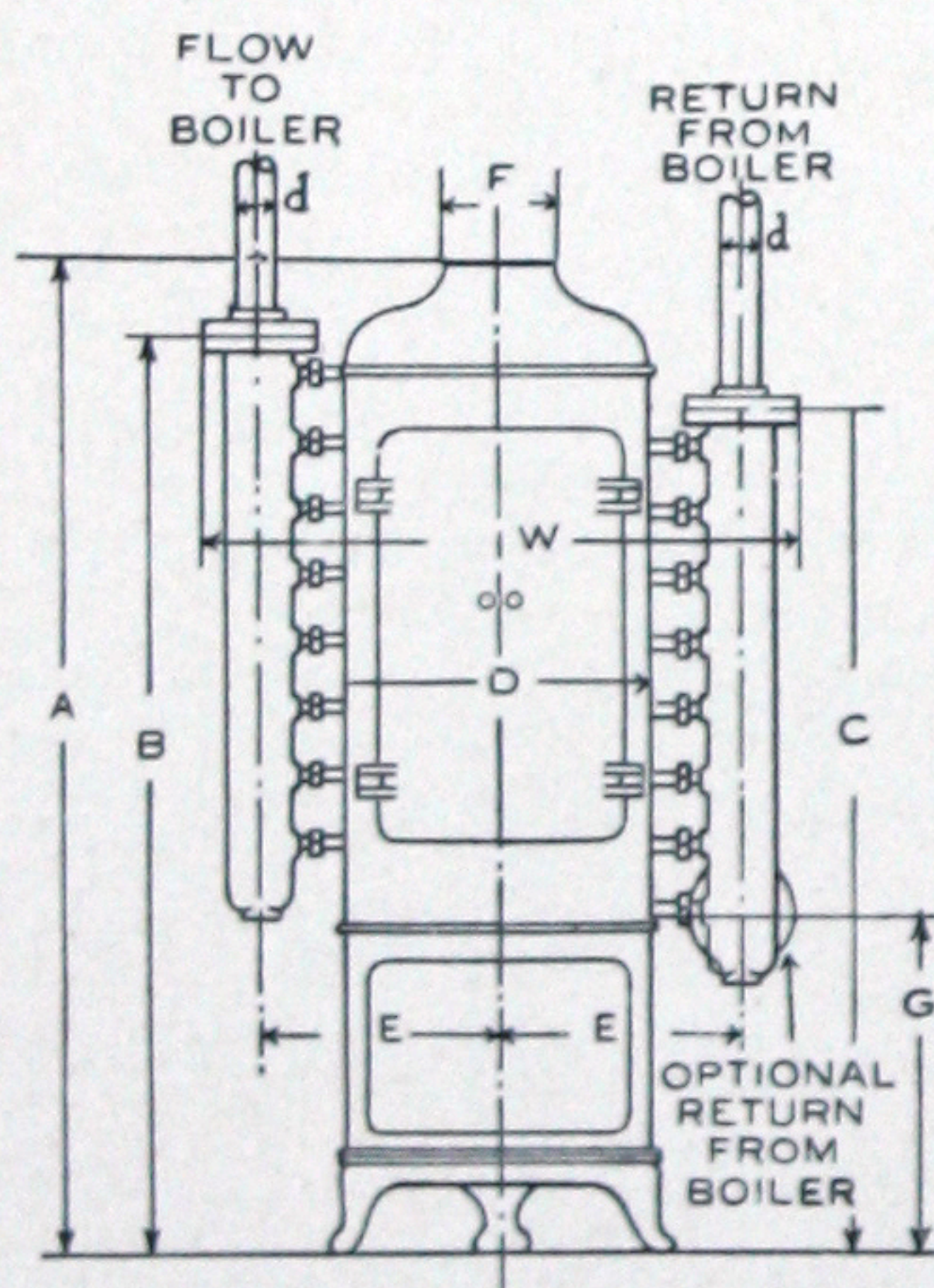
The elementary principles used in the example on page 19 also apply to the selection of these larger systems, but of course the conditions may be a great deal more complicated. The services of our engineering department are always available.

SELECTION OF SIZE (Continued)

SIZE SYSTEM	APPLICATION
No. 100 heater, with 80-, 100- or 150-gal. tank.	Residences having three to five bathrooms, bedroom lavatories large kitchen sink, pantry sink and laundry. Apartment buildings with six apartments of four or five rooms each.
No. 200 heater, with 150-, 200- or 250-gal. tank.	Residences having five to eight bathrooms, large kitchen sink, dishwashing machine, large laundry. Apartment buildings having from six to twelve apartments of five or six rooms each.
No. 300 heater, with 250-, 300- or 365-gal. tank.	Residences having seven to ten bathrooms, large kitchen sink, pantry sink, dish-washing machine, large laundry. Apartment buildings having from ten to twenty apartments of five or six rooms each.
No. 500 heater, with 425-, 500-, 600- or 700-gal. tank.	Apartment buildings having from twenty to thirty apartments of five, six or seven rooms each. Very large homes. Forty- to sixty-room hotels.

GENERAL TABLE—RUUD MULTI-COIL AUTOMATIC STORAGE SYSTEMS

Size Heater	Capacity Per Hour 63° Temp. Rise	Height Over All "A"	Width Over All "W"	Diameter Shell "D"	Size Manifold Connection "d"	Size Gas Inlet	Size Flue "F"	Size Moment Valve	Nat. Gas Required Per Hour	Art. Gas Required Per Hour	Size Meter	Weight Crated
No. 100	Gallons 100	Inches 45	Inches 27	Inches 12½	Inches 1½	Inches ¾	Inches 5	Inches ¾	Cu. Ft. 80	Cu. Ft. 142	Lt. 20	Pounds 325
No. 200	200	49⅞	29½	14	2	1	6	1	150	280	30	430
No. 300	300	53⅜	32	16	2	1	6	1	225	375	45	500
No. 500	500	64⅞	38½	20½	2½	2	8	1½	375	650	80	935



RUUD MULTI-COIL STORAGE HEATER DIMENSIONS

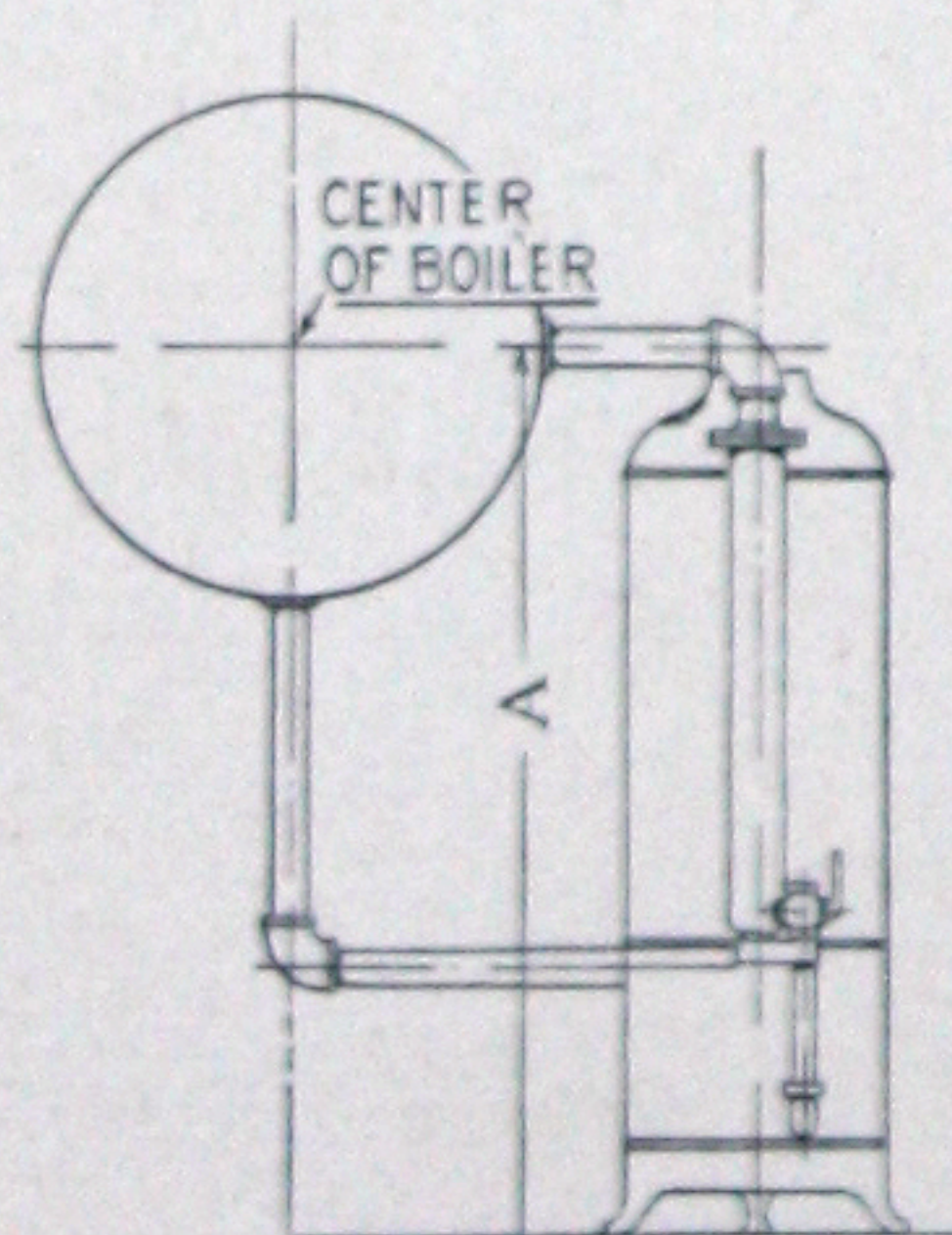
No.	A	B	C	D	E	F	G	d	W
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
100	45	41¾	37¾	12½	10¾	5	17¼	1½	27
200	49⅞	46⅝	42½	14	11¾	6	17½	2	29½
300	53⅜	49½	45½	16	13	6	18	2	32
500	64⅞	58½	53½	20½	15¾	8	18½	2½	38½

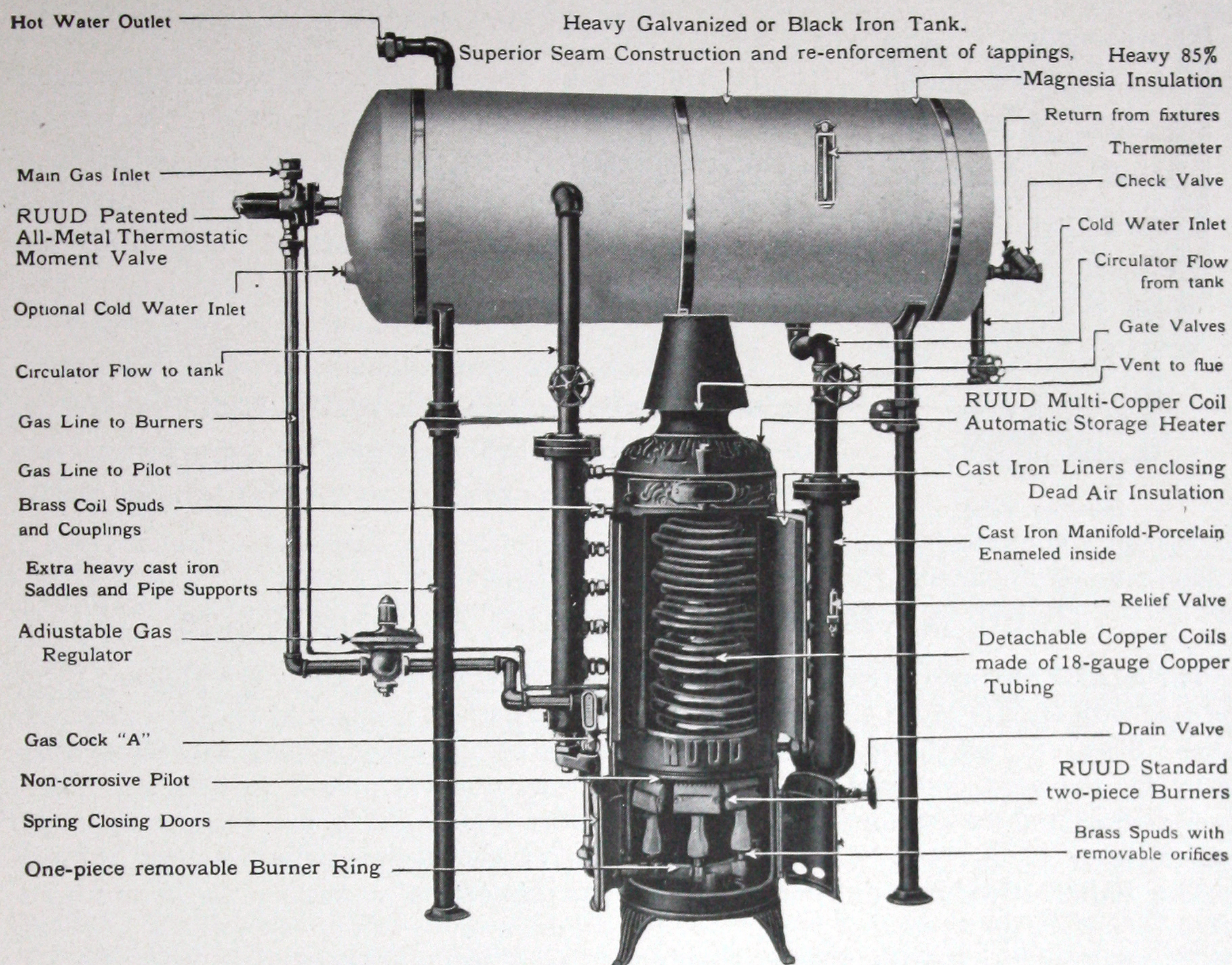
ROUGHING-IN DIMENSIONS

Minimum Height of Tank

Heater	No. 100	No. 200	No. 300	No. 500
A	47 in.	53 in.	56 in.	66 in.

NOTE—Where the headroom is limited, it is not always possible to use standard dimensions for height of tank. Therefore we give above table showing dimensions for the lowest tank setting without placing the heater in a pit.





General Features of Construction

SHELL

Best grade light gray iron castings with sectional construction for ease of dismounting. Back section has double spring doors on upper half—both upper and lower front sections have double spring doors. Cast iron inner lining provides dead air space insulation for entire heat zone. Shell assembled by heavy bolts, as few in number as possible.

COILS

18 gauge seamless "Premium" copper tubing is used, tested to 1,000 pounds pressure and again to 300 pounds after assembly. Individual coils easily removable, being connected to manifolds outside of heater by ground seat unions.

MANIFOLDS

Made of cast iron, finished on inside with vitreous enamel, which prevents rust and corrosion.

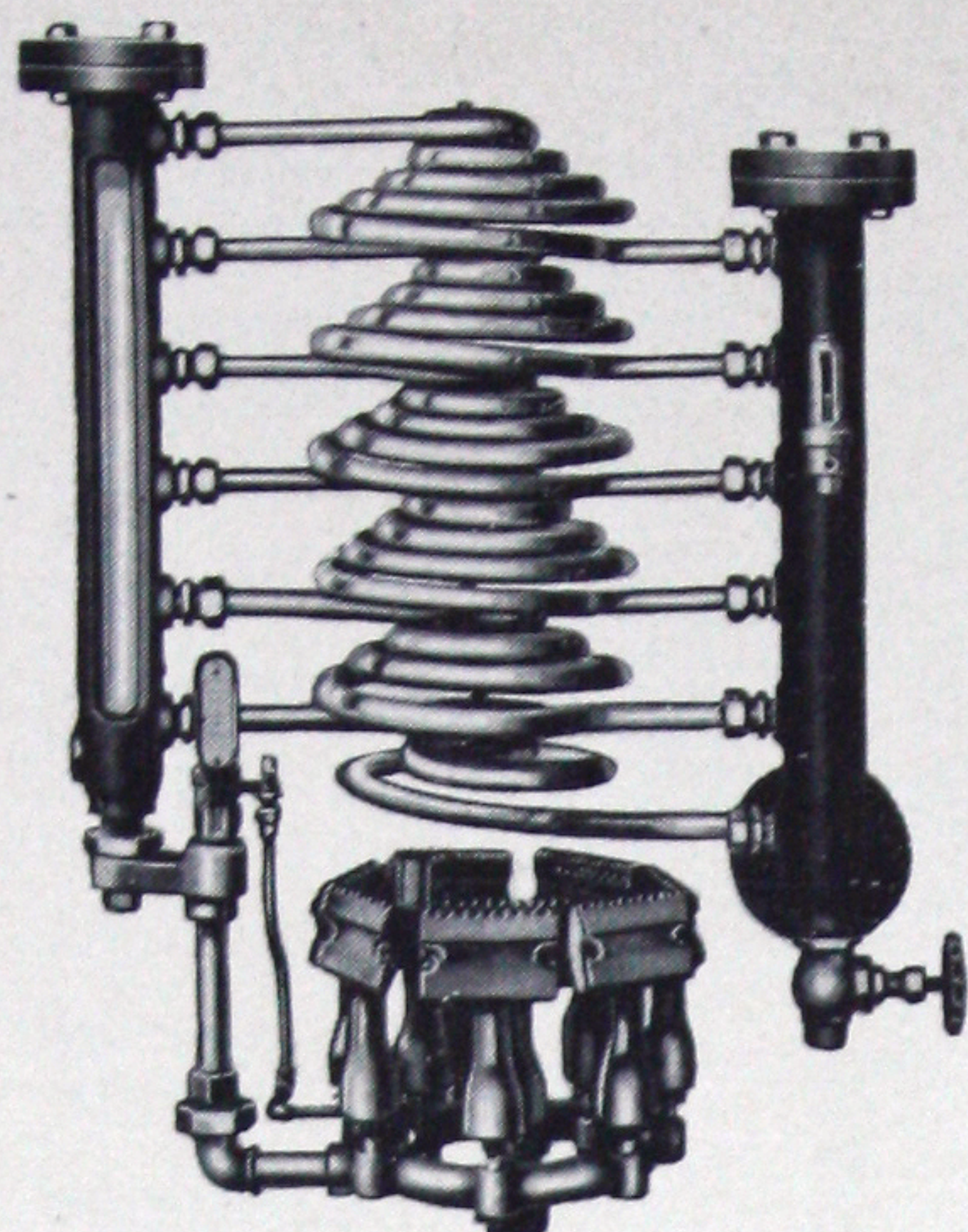
BURNERS

Burners are cast iron (Bunsen Type) and of special flash proof design. Made in two pieces with perforated flat brass flame check between. Mounted on brass spuds having detachable orifices. Easily removed and dismantled, no matter how long in operation.

COIL ARRANGEMENT

Coils are independent and detachable. Those nearest the burners are of large diameter and shorter length than those in the upper portion of the heat zone. Therefore where the heat is intense the circulation is rapid, and in the upper portion of the heat zone where the gases are cooler the circulating water is retained for a longer time, thus absorbing the maximum amount of heat.

(Continued on next page)



Skeleton View
Showing Coil Arrangement

COIL ARRANGEMENT (Continued)

It will also be noticed that cold water is introduced at the top of the heater as well as at the bottom. The comparatively cool gases at the top of the heat zone are still hotter than the water at this point and the gases give up their heat instead of its being lost through the flue.

Try to look downward through the coils that constitute the heating surface of a RUUD Multi-Coil Heater. Note the complete baffling of the hot gases instead of a number of open channels to pass the heat through rapidly and waste it.

Ruud All-Metal Thermostatic Moment Valve

The RUUD Moment Valve should always be used with RUUD Multi-Coil Storage Systems. Sizes, etc., are shown in the table. It is by far the most dependable fuel control ever devised and insures the highest operating efficiency.

The RUUD Graduating Thermostat is

sometimes substituted for the Moment Valve where natural gas is sold at a low rate. It must be understood that the Graduating Thermostat will permit varying size flames at the burner and is not economical in the use of gas owing to the heat lost through the chimney.

RUUD THERMOSTATIC MOMENT VALVE

Size of Valve	Standard with Heater No.	Tank Tapping Required	*Total Length	Length Inside Tank	Length Outside Tank	Shipping Weight	Weight Net
<i>Inches</i> $\frac{3}{4}$	100	<i>Inches</i> $1\frac{1}{4}$	<i>Inches</i> $23\frac{3}{4}$	<i>Inches</i> $15\frac{1}{2}$	<i>Inches</i> $8\frac{1}{4}$	<i>Pounds</i> 32	<i>Pounds</i> 12
1	200—300	$1\frac{1}{4}$	32	22	10	47	22
$1\frac{1}{4}$	Duplex 200—300	$1\frac{1}{4}$	32	22	10	54	29
$1\frac{1}{2}$	500	$1\frac{1}{2}$	$42\frac{1}{2}$	$30\frac{1}{2}$	12	65	32
2	Duplex 500	$1\frac{1}{2}$	$42\frac{1}{2}$	$30\frac{1}{2}$	12	73	39

NOTE—Moment Valves are tested and adjusted to 150° F. before shipping.

*Clearance required between end of tank and wall or partition to remove Moment Valve.

Ruud "Duplex" Multi-Coil Storage Systems

2—No. 200 Heaters with 500 Gallon Tank

2—No. 300 Heaters with 500 Gallon Tank

2—No. 300 Heaters with 600 Gallon Tank

2—No. 300 Heaters with 700 Gallon Tank

2—No. 300 Heaters with 800 Gallon Tank

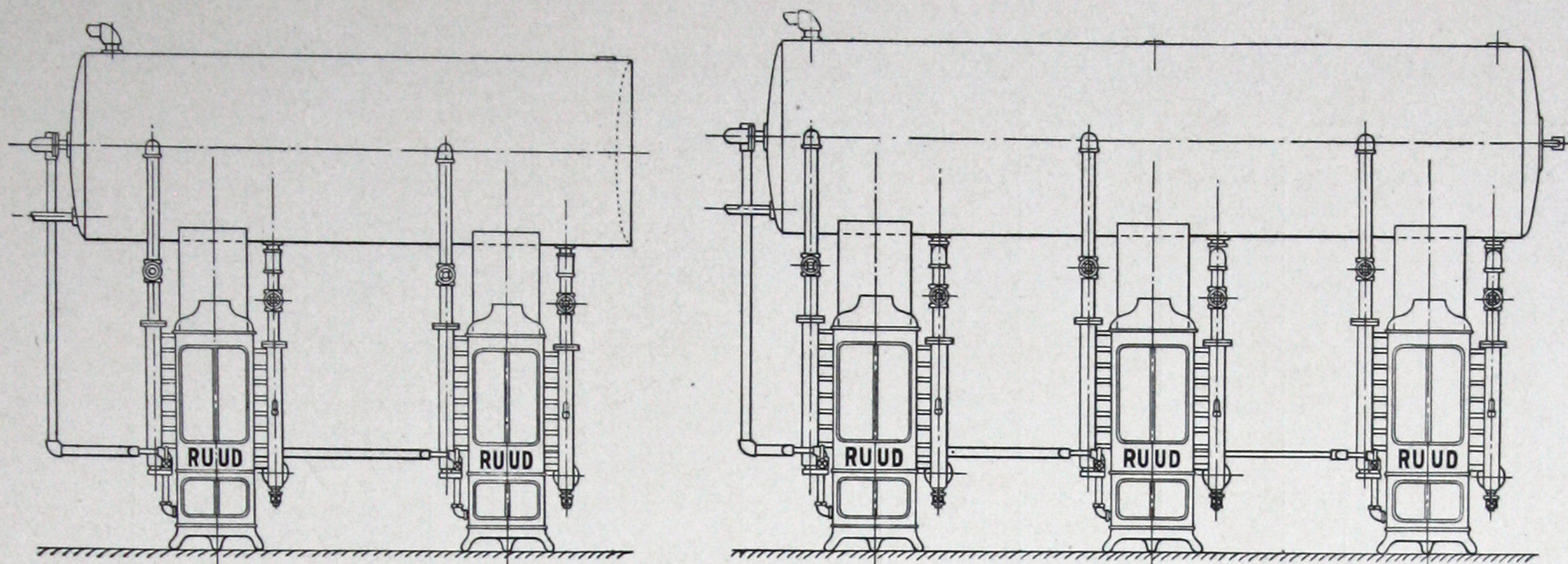
2—No. 500 Heaters with 800 Gallon Tank

2—No. 500 Heaters with 1000 Gallon Tank

Combinations listed above are typical systems for standard installations most frequently used. However, other combinations consisting of three or more heaters

and tanks of greater capacity can be furnished to meet any hot water requirement.

Black Iron Tanks are furnished regularly with Duplex Systems.



Ruud "Duplex" and "Triplex" Storage Systems for Large Requirements

The connection of two or more heaters to one tank not only insures a correspondingly greater heating capacity, but also affords the advantage of enabling one heater to be temporarily shut down for cleaning or repairs without stopping the hot water service. The other heater or heaters can carry the work under such emergencies, and vice versa.

When the demands on the hot water service are light at certain times, one heater can be shut down or they can be worked alternately.

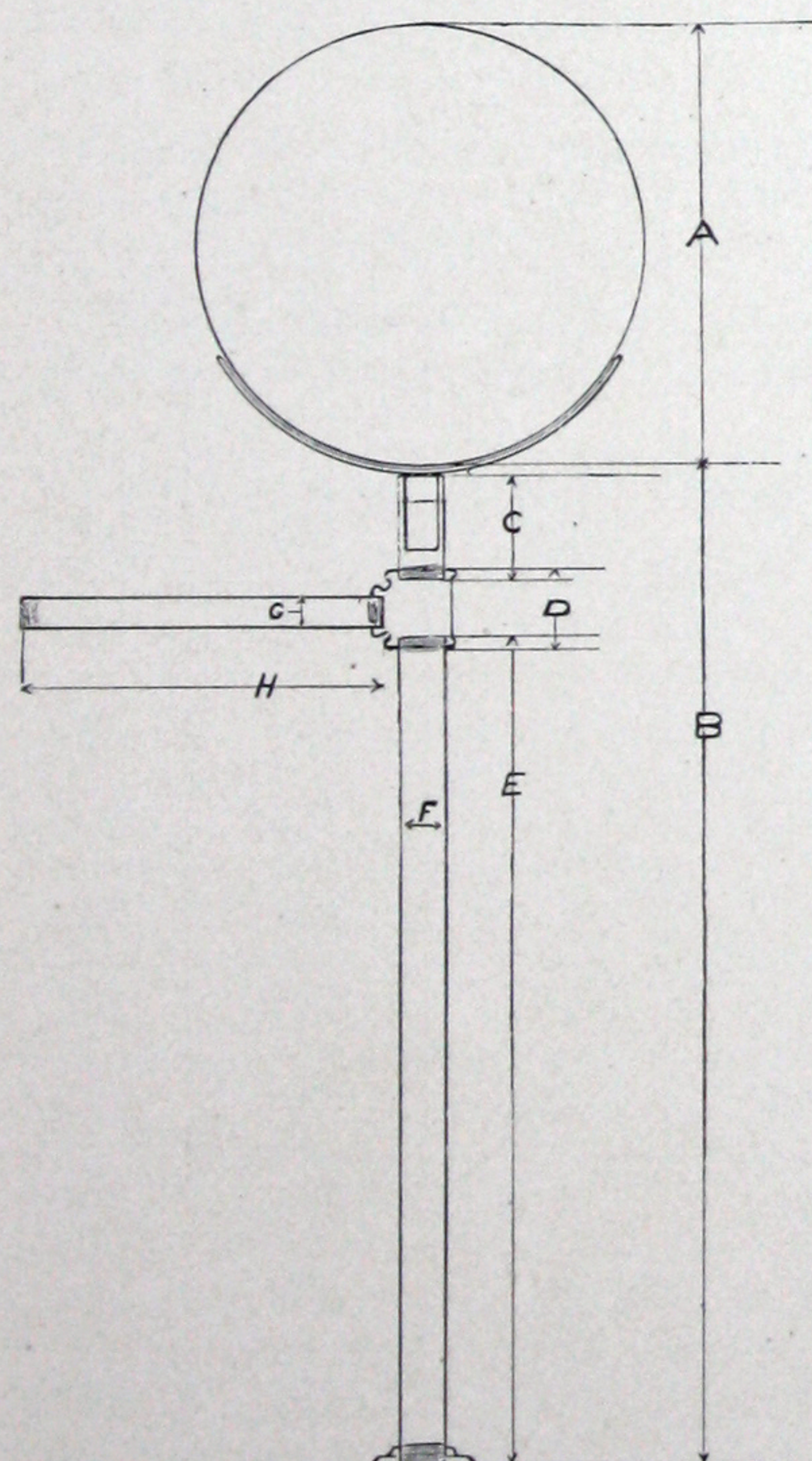
These advantages are especially valuable in hospitals, hotels and places where temporary interruption of hot water service would cause great inconvenience.

Ruud Storage Tanks

RUUD Multi-Coil Storage System Tanks are made of heavy black or galvanized iron, carefully riveted and otherwise constructed in accordance with our special requirements. Realizing that the usefulness of a storage

system depends upon the life of the tank, extra weight material and extra careful construction is used in all RUUD Tanks. Copper tanks can be furnished when ordered.

TABLE OF STANDARD SIZES OF BOILER SUPPORTS



Size of Boiler		80		150	250	425			
		100	100	200	365	500	600	700	800
No. Heater Used				100					
		100	200	200	300	500	500	500	500
Diameter Boiler	A	Inches 20	Inches	Inches	Inches	Inches	Inches	Inches	Inches
		22	22	24	30	36	42	42	48
Height floor to boiler	B	56	56	54	54	62	62	62	62
Sht. Nipple thread, one end	C	5½	5½	5½	5½	5½	5½	5½	5½
Length of Tee	D	3¾	3¾	4¼	4½	4½	5	5	5
Length of pipe for standard	E	47¼	47¼	41¾	41¾	49¾	49¼	49¼	49¼
Size of pipe	F	1½	1½	2	2½	2½	3	3	3
Size of pipe for brace	G	1	1	1¼	1½	1½	2	2	2
Length of brace	H	18	18	20	24	27	30	30	30

NOTE—Standards and supports are not furnished for tanks larger than 500 gallons. Brick or concrete piers should support tanks of this capacity.

BLACK AND GALVANIZED IRON TANK STORAGE COMBINATIONS

Number Heater	Capacity of Tank	No. of Tank	Diameter of Tank	Length of Tank	No. of Heaters Tapped For	Cold Inlet to Tank	Hot Outlet from Tank	Size Circulators	Thickness of Tank	
									Shell	Head
100	<i>Gallons</i> 80	1	<i>Inches</i> 20	<i>Inches</i> 60	1	<i>Inches</i> 1 1/4	<i>Inches</i> 1 1/4	<i>Inches</i> 1 1/2	<i>Inches</i> 1/4	<i>Inches</i> 5/16
100	100	2	22	60	1	1 1/4	1 1/4	1 1/2	1/4	5/16
100	150	4	24	76	1	1 1/4	1 1/4	1 1/2	1/4	5/16
200	100	5	22	60	1	1 1/4	1 1/4	2	1/4	5/16
200	150	7	24	76	2	2	1 1/2	2	1/4	5/16
200	200	8	24	102	2	2	1 1/2	2	1/4	5/16
200	250	9	30	84	2	2	1 1/2	2	1/4	5/16
200	300	10	30	96	2	2	1 1/2	2	1/4	5/16
300	200	11	24	102	2	2	2	2	1/4	5/16
300	250	12	30	84	2	2	2	2	1/4	5/16
300	300	13	30	96	2	2	2	2	1/4	5/16
300	365	15	30	120	2	2	2	2	1/4	5/16
500	425	21	36	96	2	2 1/2	2 1/2	2 1/2	1/4	3/8
500	500	22	36	114	2	2 1/2	2 1/2	2 1/2	1/4	3/8
500	600	23	42	102	2	2 1/2	2 1/2	2 1/2	5/16	7/16
500	700	24	42	120	2	2 1/2	2 1/2	2 1/2	5/16	7/16
500	800	25	48	102	2	2 1/2	2 1/2	2 1/2	5/16	7/16
500	1000	26	48	126	2	2 1/2	2 1/2	2 1/2	5/16	7/16

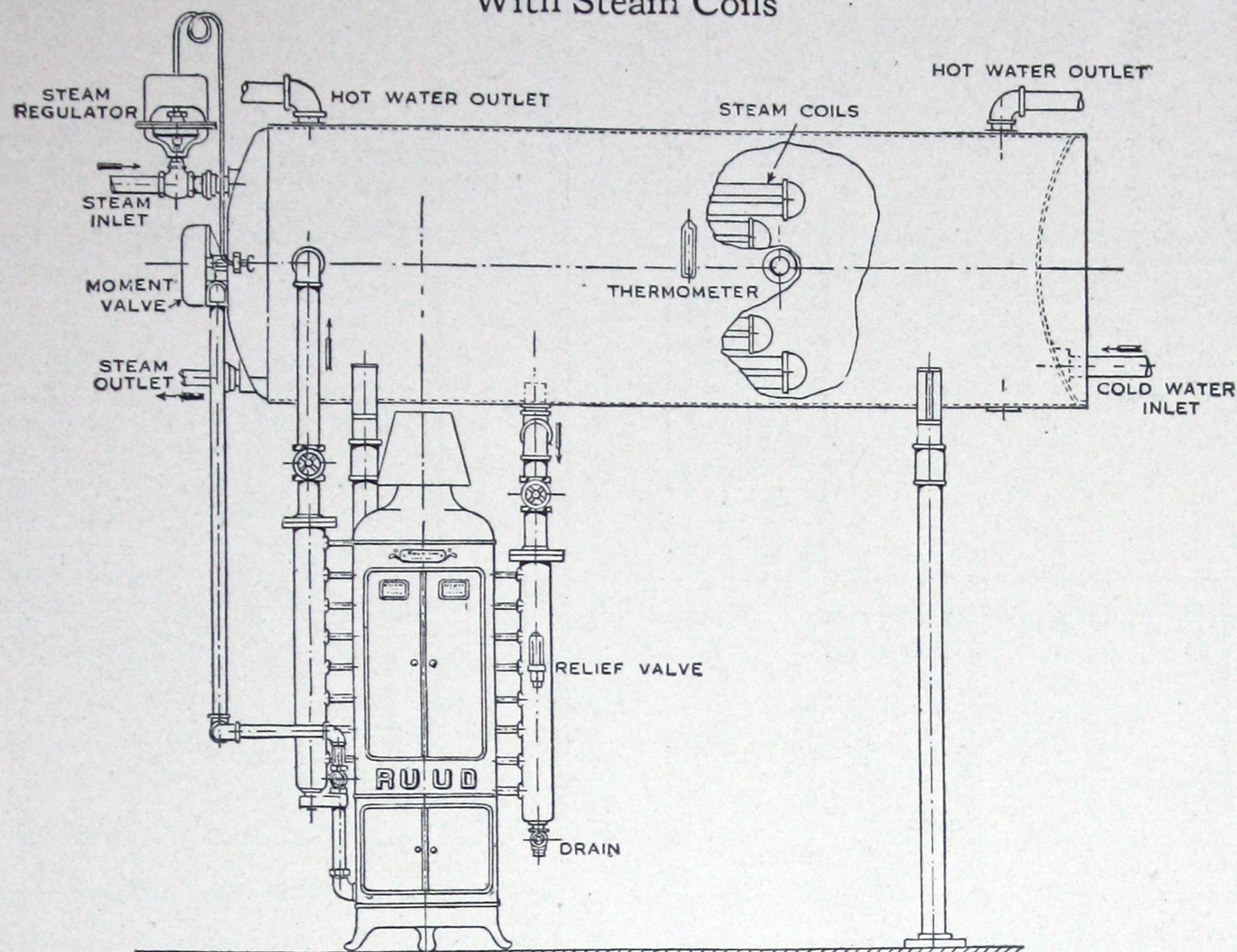
COPPER TANK STORAGE COMBINATIONS

Heater No.	Tank Capacity	No. of Tank	*Diameter	*Length	No. Heaters Tapped For	Cold Inlet	Hot Outlet	Circulators	Standard Test	Extra Heavy Test
100	<i>Gallons</i> 80	1	<i>Inches</i> 20	<i>Inches</i> 60	1	<i>Inches</i> 1 1/4	<i>Inches</i> 1 1/4	<i>Inches</i> 1 1/2	<i>Pounds</i> 200	<i>Pounds</i> 300
100	100	2	22	60	1	1 1/4	1 1/4	1 1/2	200	300
100	150	3	24	76	1	1 1/4	1 1/4	1 1/2	200	300
200	150	4	24	76	2	1 1/2	1 1/2	2	200	300
200	200	5	24	102	2	1 1/2	1 1/2	2	200	300
200	250	6	30	84	2	1 1/2	1 1/2	2	200	300
200	300	7	30	96	2	1 1/2	1 1/2	2	200	300
300	200	8	24	102	2	2	2	2	200	300
300	250	9	30	84	2	2	2	2	200	300
300	300	10	30	96	2	2	2	2	200	300

Copper tanks can be equipped with copper steam heating coils and manholes or handholes.

*These dimensions are standard, but tanks of special dimensions can be furnished.

Ruud Multi-Coil Automatic Storage System With Steam Coils



Ruud Automatic Multi-Coil Storage System with Steam Coils in Tank. Especially Adapted for Apartment Buildings and Large Residences having Steam Heating Systems

RUUD Steam Coils are made from heavy seamless copper tubes, thoroughly tested, and guaranteed as to heating capacity, efficiency and durability. All joints are brazed and provided with brass nipples and lock-nuts. The Steam Coils are based on raising the temperature of the water for a given size boiler seventy degrees in one hour, using steam at five pounds gauge pressure.

When Steam Coil is included, an extra charge will be added to the regular price

of the system. We can furnish coils made of galvanized iron pipe when requested.

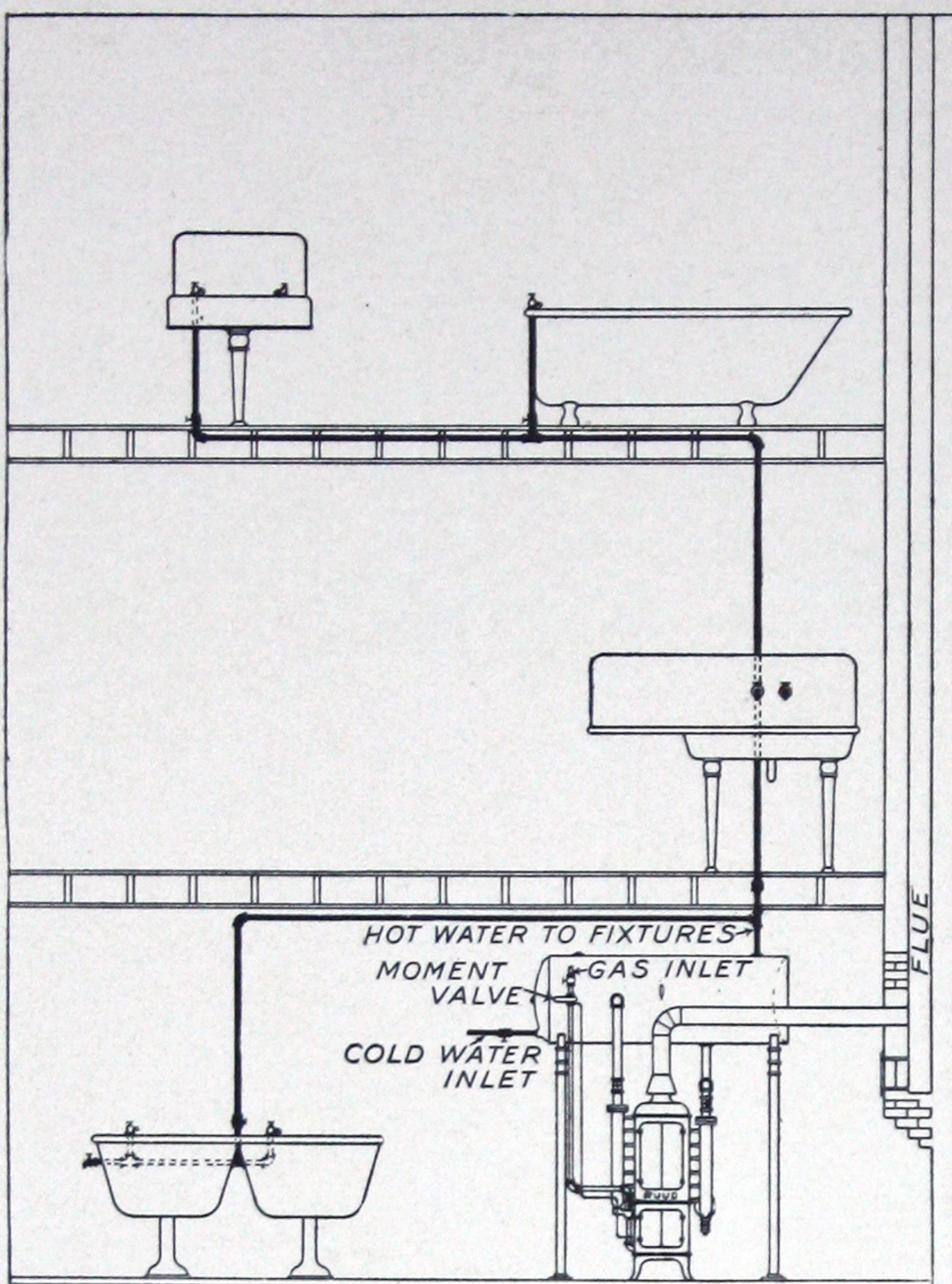
When Steam Coils are used, tank should be equipped with man-hole, which we make in 9"x14" size yoke style. Hand-hold can also be furnished when desired.

We recommend that a Steam Regulator be used on tanks having Steam Coils, in order to insure a uniform temperature of hot water, and for economy in steam consumption.

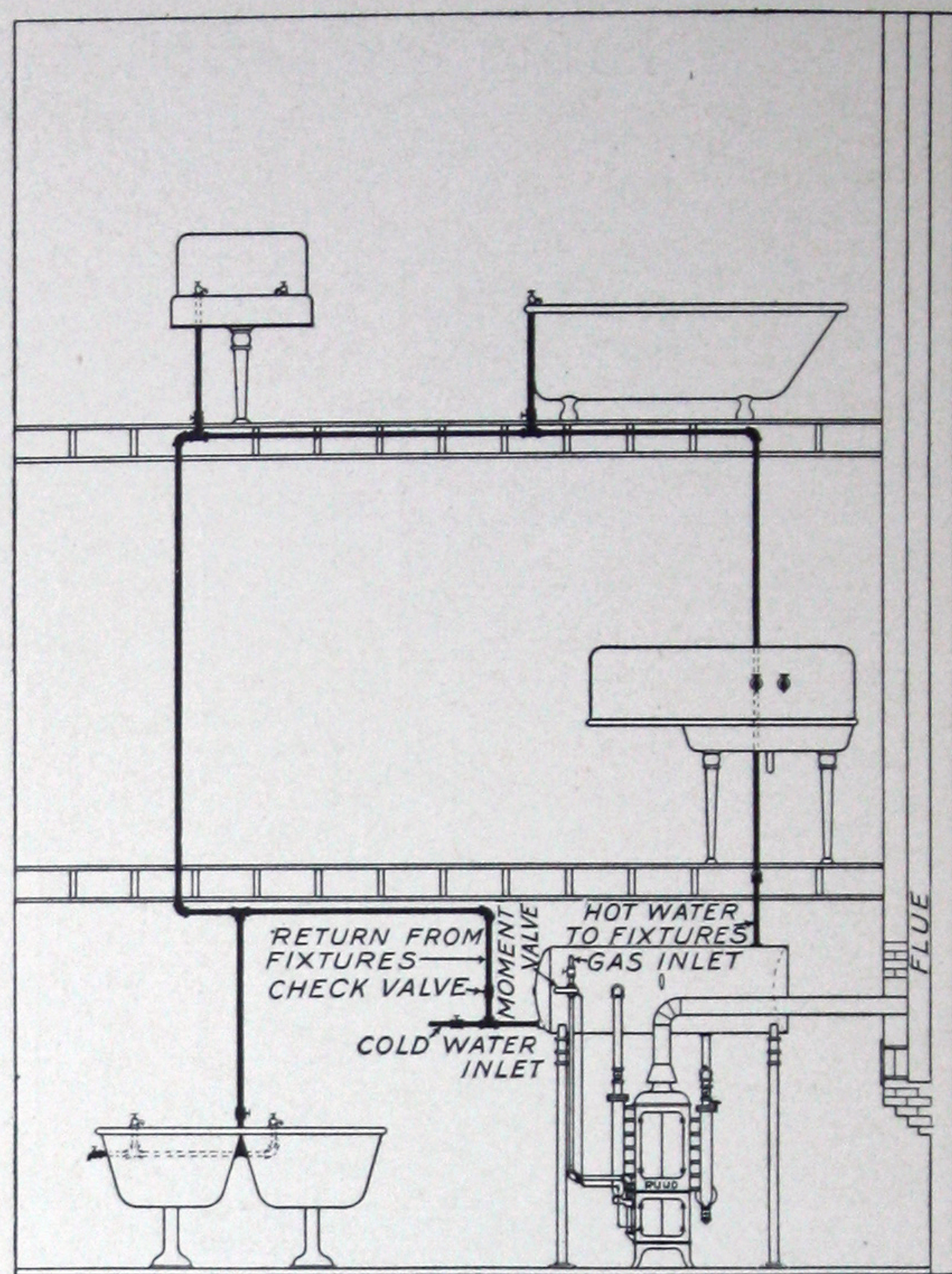
STEAM COILS FOR BLACK IRON, GALVANIZED IRON AND COPPER TANKS

Size Tank In Gallons	Copper		Galvanized	
	Diameter Inches	Length Feet	Diameter Inches	Length Feet
80	1	12	1	15
100	1	15	1	18
150	1	20	1	25
200	1 1/4	23	1 1/4	25
250	1 1/4	27	1 1/4	30
300	1 1/4	31	1 1/4	35
365	1 1/4	40	1 1/4	45
425	1 1/2	40	1 1/2	45
500	1 1/2	52	1 1/2	55
600	1 1/2	60	1 1/2	63
800	1 1/2	80	1 1/2	80
1000	1 1/2	100	1 1/2	100

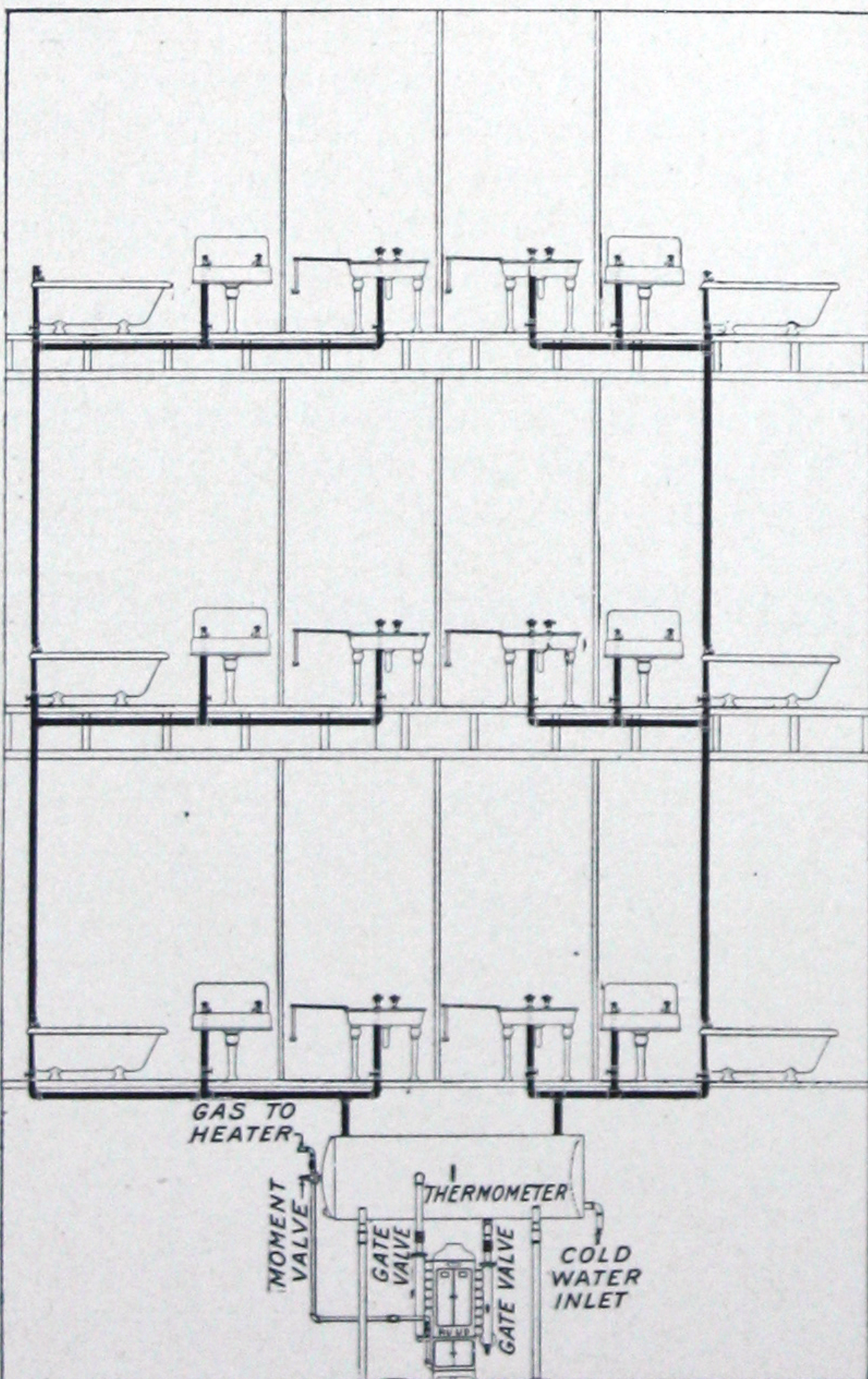
NOTE—Lengths given in table will raise temperature seventy degrees in one hour, using steam at five pounds gauge pressure.



Ruud Multi-Coil Automatic Storage System installed on direct system of plumbing



Ruud Multi-Coil Automatic Storage System installed on return circulation system of plumbing



Ruud Multi-Coil Automatic Storage System installed in six-family apartment building

Installation Information

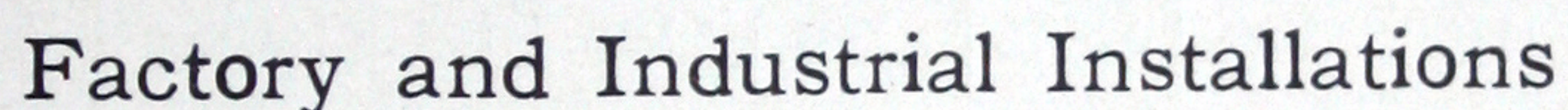
Here are shown the usual methods of installation, but should specific conditions make it desirable, many variations can be made. It is only necessary to consider those principles common to any hot water system of the circulatory type. Our services and advice are freely offered, should they be desired.

In general, these cardinal points should be observed:

System should be located as close to the point of most frequent use as flue and other conditions will permit. Connection to flue having a good draft is essential. Avoid long flat runs of flue pipe and never reduce the size. The RUUD draft hood should always be used and must be placed in a vertical position. It prevents down drafts from entering the heater. Cold water line of the size specified in the general table, page 28, should be run from the cold water main to the inlet tapping of the tank.

Hot water lines should not be larger than the outlet tapping of the tank, unless warranted by special conditions. Large sizes of pipe and long runs mean that more cold water must be discharged before hot water is delivered at the faucet, unless return circulation lines are used.

Use gas line of size specified in the general table. If the line is over 100 feet long, use the next larger size. The best practice is to place the gas regulator between the Moment Valve and the Heater.



In case of failure or shut-down of the steam or heating plant, the RUUD takes up

Capacities of Heaters

TEMPERATURE RAISE

Gallons Per Minute

Size of Heater	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°
No. 85...	2.52	2.10	1.80	1.58	1.40	1.26	1.15	1.05	.97	.90	.83
No. 95...	3.15	2.62	2.25	1.97	1.75	1.58	1.43	1.31	1.21	1.12	1.05
No. 3...	3.78	3.15	2.70	2.36	2.10	1.89	1.72	1.58	1.45	1.35	1.26
No. 4...	5.05	4.20	3.60	3.15	2.80	2.52	2.29	2.10	1.94	1.80	1.68
No. 6...	7.58	6.30	5.40	4.73	4.20	3.87	3.52	3.23	2.98	2.76	2.58
No. 8...	10.10	8.40	7.20	6.30	5.60	5.04	4.59	4.20	3.88	3.60	3.36

TEMPERATURE RAISE

Gallons Per Hour

No. 100..	126	105	90	78.8	70	63	57.2	52.5	48.4	45	42
No. 200..	252	210	180	157.5	140	126	114.5	105	97	90	84
No. 300..	378	315	270	236	210	189	172	158	145	135	126
No. 500..	630	525	450	394	350	315	287	262	242	225	210

About Heater Capacities

It must be understood that the capacity of any water heater has a definite relation to the temperature of the incoming water. For example, in New Orleans, La., the temperature of the water in the city mains averages about 65 degrees. The heater, therefore, must add 60 degrees to deliver water at 125 degrees from the faucet.

On the other hand, the temperature of the incoming water at Buffalo, N. Y., averages about 45 degrees. In this case the heater must add 80 degrees to deliver water at 125

degrees at the faucet. Owing to this difference in the temperature of the incoming water, the heater may be said to have a greater capacity in New Orleans than in Buffalo. A No. 4 RUUD in New Orleans will give a little over one gallon more of hot water per minute than the same heater in Buffalo, the temperature at the hot water faucet being the same.

Likewise, a heater will deliver more hot water in summer than in winter, if the temperature at the hot faucet remains the same.

Determining the Capacity For Any Location

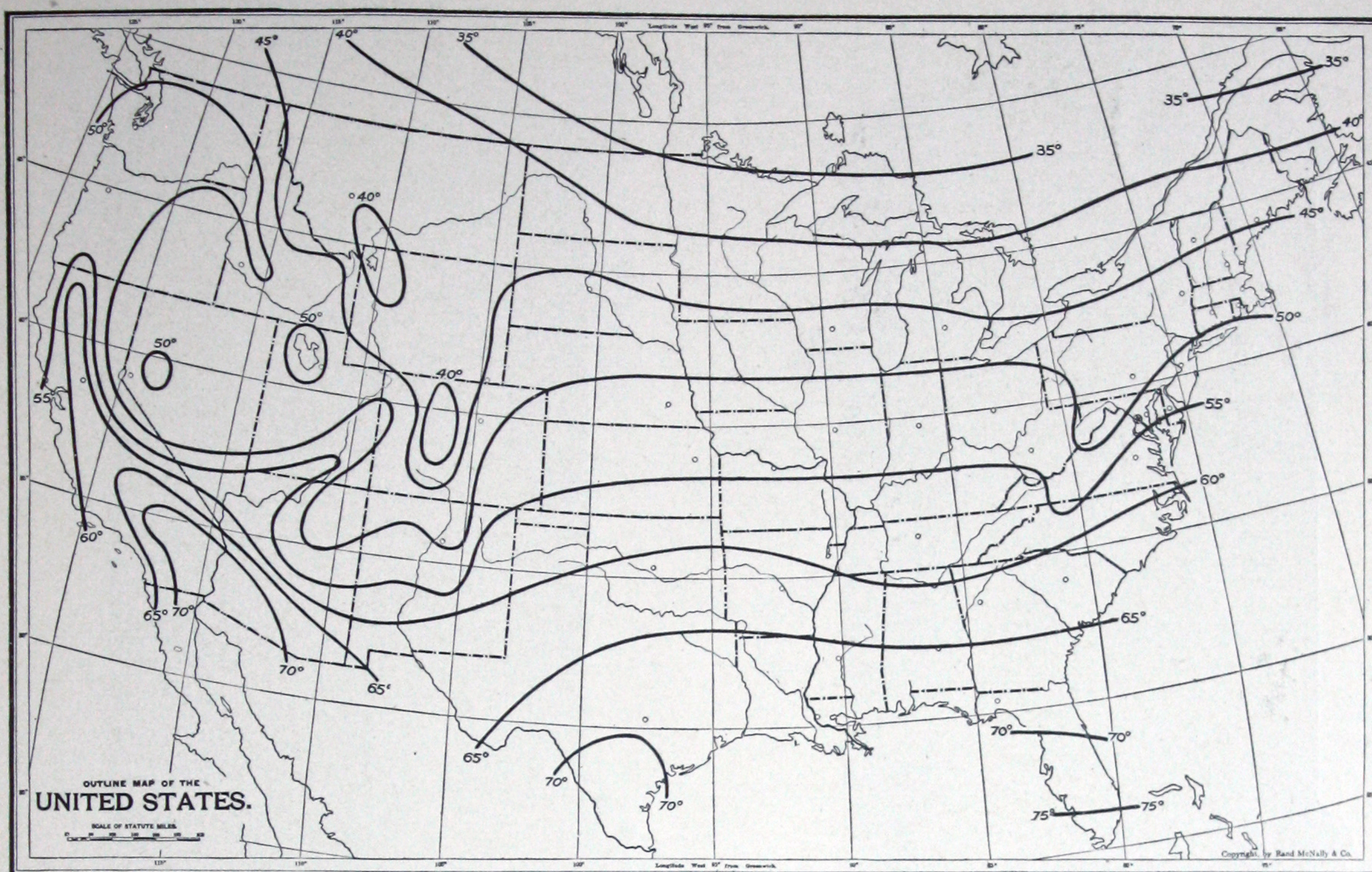
The map on the next page shows the average annual temperature of the United States and Canada, and therefore the approximate temperature of the incoming water in any given location. It is important to understand that it does not indicate the highest summer temperature or the lowest winter temperature, but rather the average as compiled by the United States Weather Bureau over a period of many years.

Assume the temperature of hot water for

all-round domestic purposes to be 125 degrees. Refer to the map and ascertain the zone in which you are located. The difference between the degree of the zone boundary line nearest you and 125 degrees represents the temperature rise required.

Then, the capacity of any RUUD Heater at this particular rise may be determined from the table showing heater capacities.

(Continued on next page)



Map Showing Average Annual Temperature

DETERMINING THE CAPACITY FOR ANY LOCATION

(Continued from page 35)

For example, New Orleans is nearest the line marked 65 degrees. This means a temperature rise of 60 degrees if hot water at 125 degrees is desired at the faucet. As indicated by the table, the capacity of a No. 4 RUUD at this rise is 4.2 gallons per minute.

It is to be expected that there will be a wide difference of opinion as to the correct temperature of hot water for various purposes. Our observation and experience indicates that 125 degrees F. at the faucet is satisfactory for average domestic use.

Useful Information

WATER

1 gallon (U. S.)	equals	231 cu. in.
1 gallon (U. S.)	"	8.33 lbs.
1 cu. ft.	"	7.48 gallons (U. S.)
1 cu. ft.	"	62.4245 lbs. (at 39° F.)
1 cu. ft.	"	59.76 lbs. (at 212° F.)
1 foot head	"	.433 lbs.

Water freezes at 32° F.

Water boils at 212° F.

GAS

A British Thermal Unit (B. T. U.) is the amount of heat required to raise 1 lb. water 1° F. in temperature.

1 cu. ft. artificial gas contains 525 B. T. U. (average).

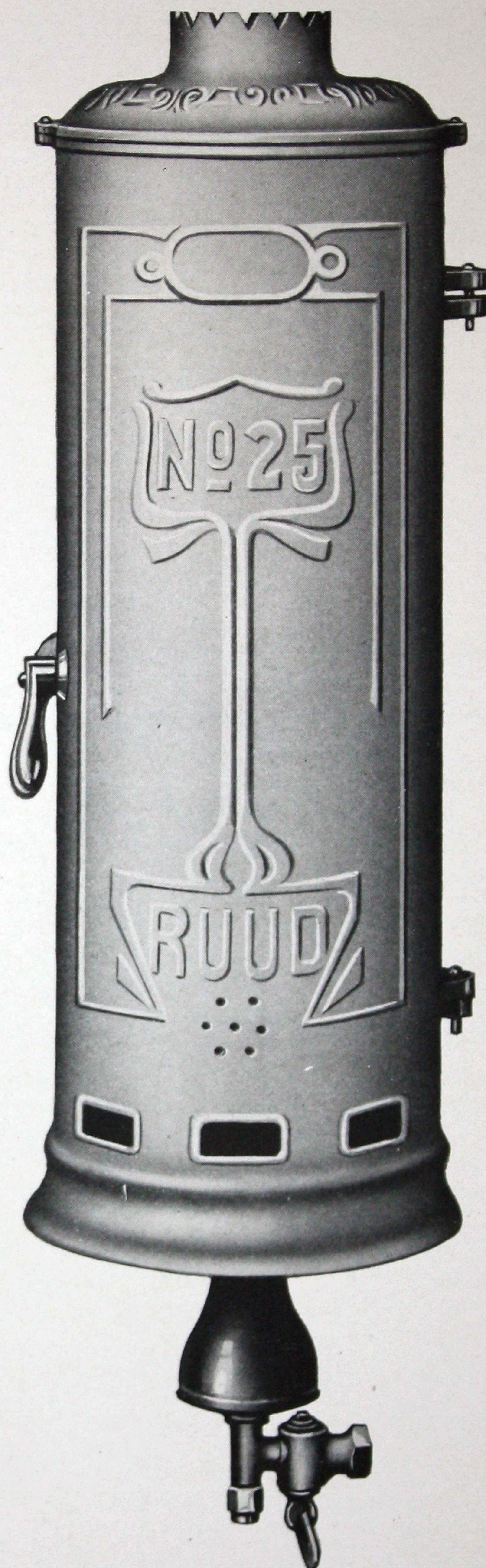
1 cu. ft. natural gas contains 1,000 B. T. U. (average).

CONTENTS OF WATER PIPES PER TEN-FOOT LENGTH

10 ft. length of	1/4 in. pipe	contains	.054 gal.
10 "	" " 3/8 "	" "	.099 "
10 "	" " 1/2 "	" "	.158 "
10 "	" " 3/4 "	" "	.277 "
10 "	" " 1 "	" "	.447 "
10 "	" " 1 1/4 "	" "	.777 "
10 "	" " 1 1/2 "	" "	1.058 "
10 "	" " 2 "	" "	1.743 "



No. 25
Black Japan Model

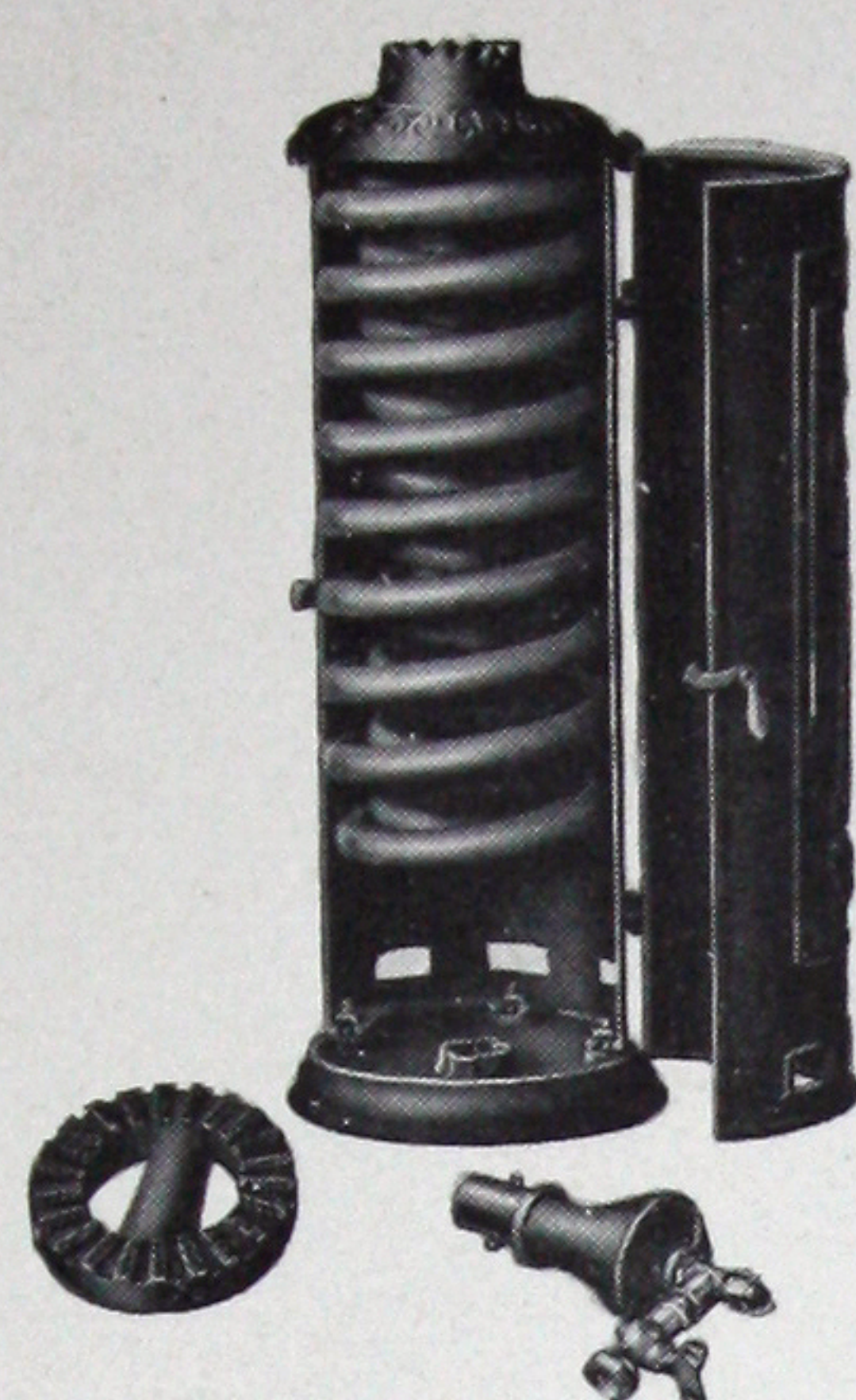


No. 25
Gray Porcelain Enameled Model

Ruud Tank Water Heaters (Non-Automatic)



No. 25



No. 25



No. 25 (Grey)

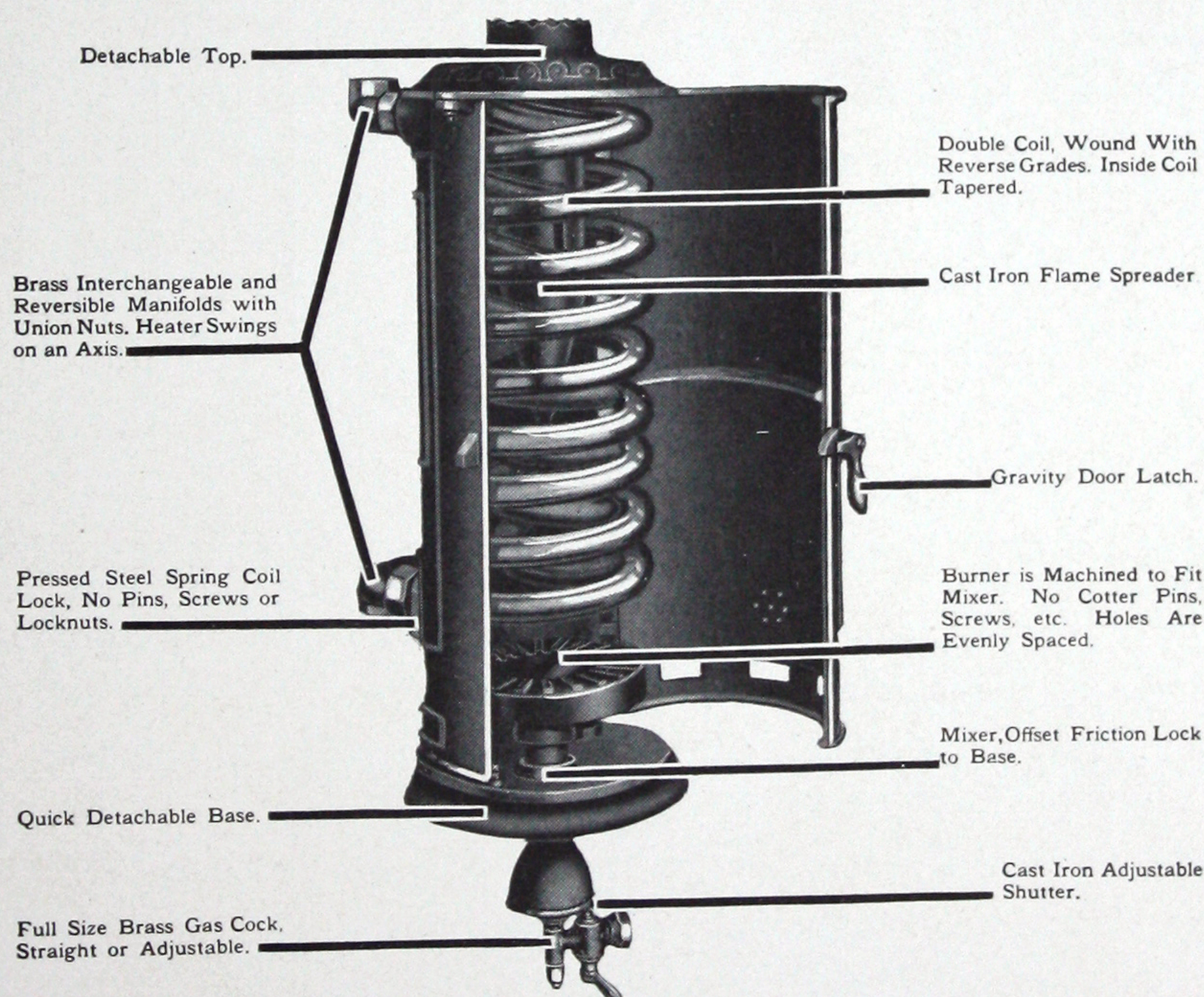


No. 35

Ruud Tank Water Heaters (Non-Automatic)

RUUD Tank Heaters are not automatic, but they embody the same high-grade design, material and workmanship as RUUD Automatic Water Heaters. Sim-

plified construction which eliminates all unnecessary parts, high heating efficiency, and ease of installation are outstanding features.



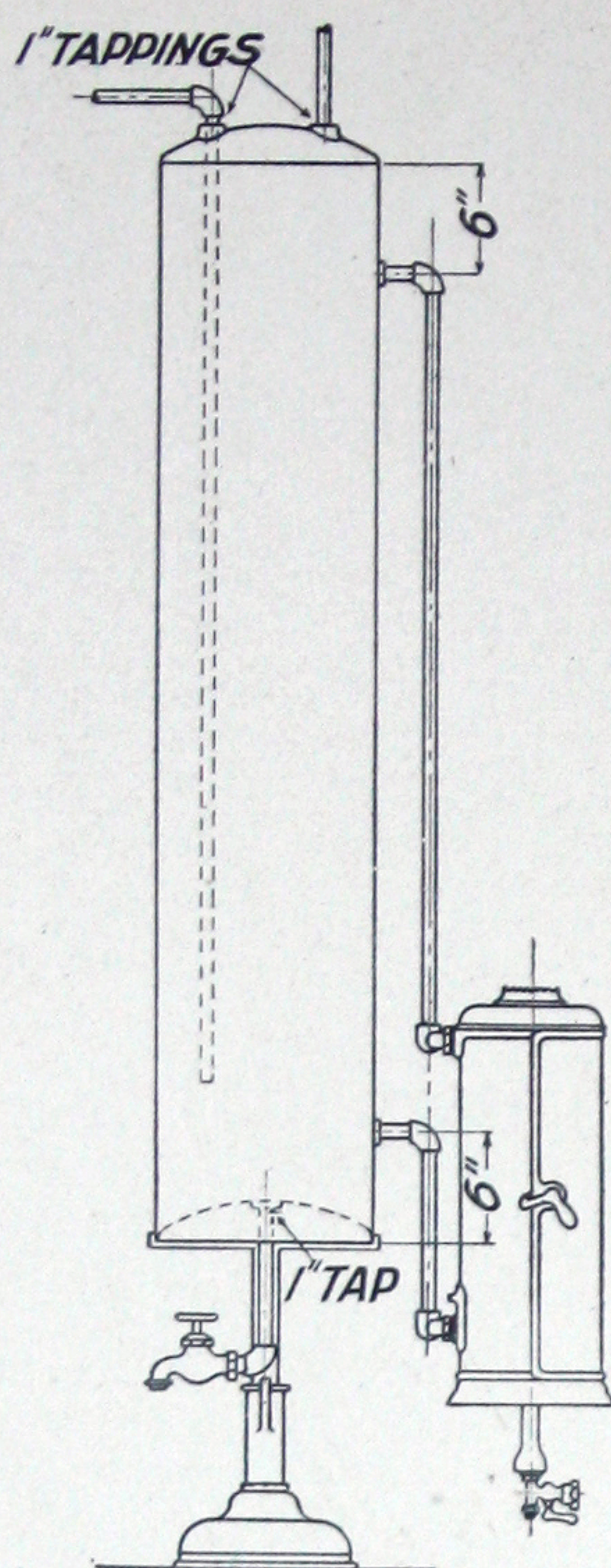
General Features of Construction

Coils are arranged to absorb the greatest possible quantity of heat. They are connected to brass manifolds outside of the heater and heat zone and each is independent and detachable. The front half of the shell is a door giving ready access to coils and burner.

The burner is cast iron and mounted on a mixer having an adjustable air shutter.

Combustion is well-nigh perfect as evidenced by the even blue flame which is characteristic of RUUD Tank Heaters.

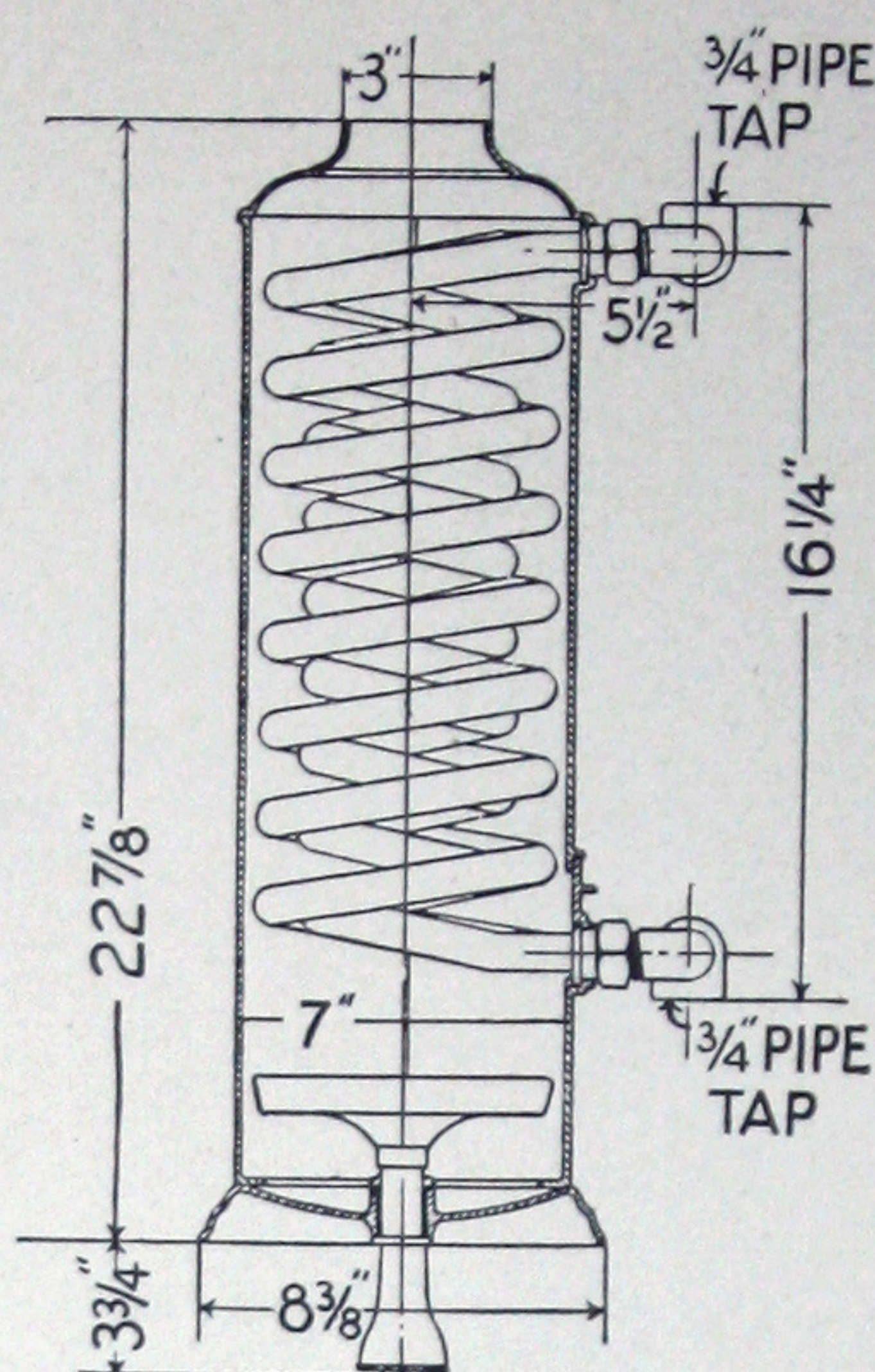
The weight of the heater is carried by the manifolds which are locked to the shell, but readily detachable. These are reversible and interchangeable, their use making unions unnecessary in installation to the tank.



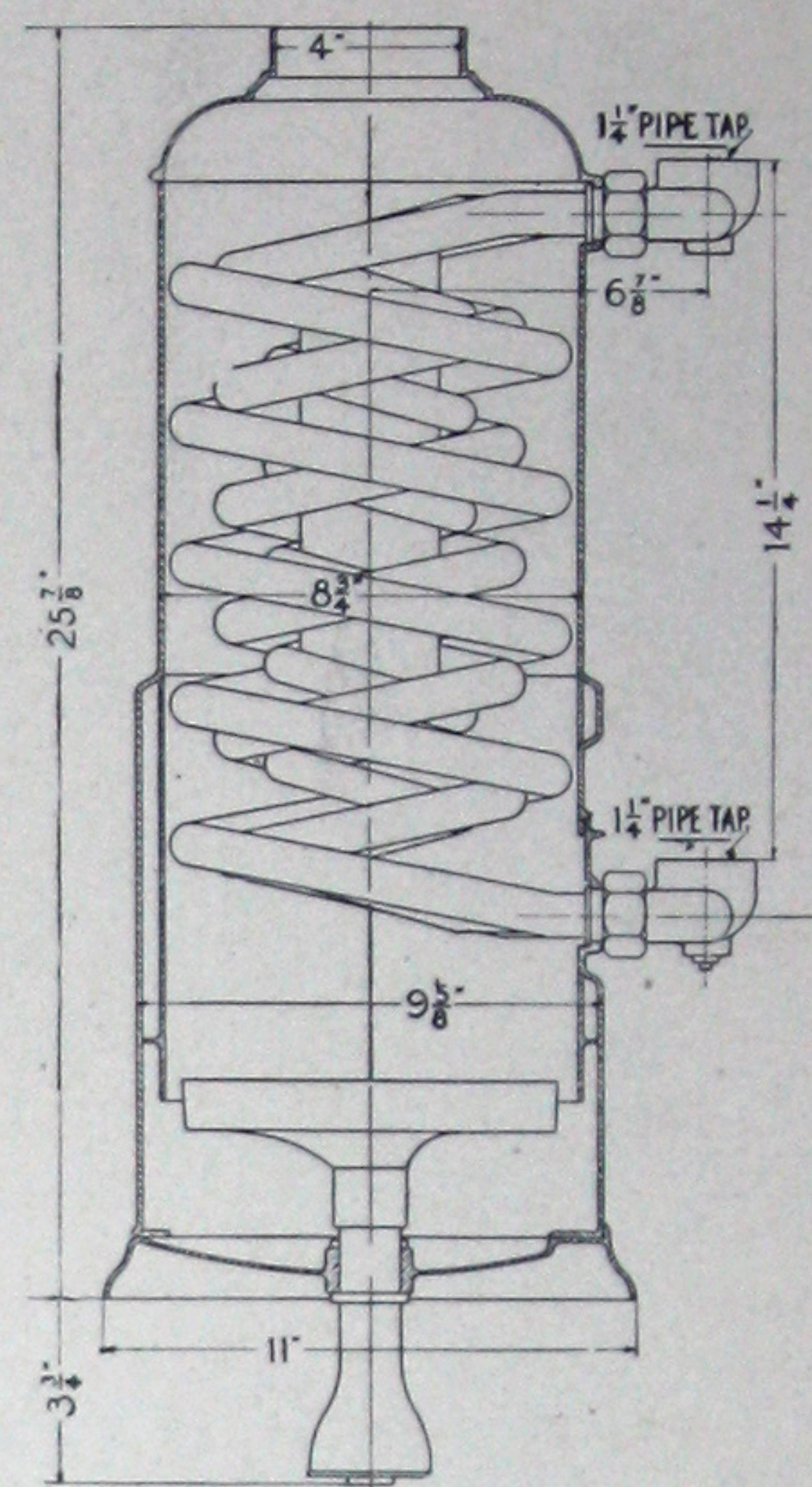
Ruud Tank Heater Installed

Illustrating the standard method of connecting

Note absence of unions in piping. Unions on heater manifolds serve the purpose, giving economy in installation and maintenance. Also note the centered inlet and outlet, which permit the heater to swing on an axis.



No. 25



No. 35

Table of Dimensions, Weights, Etc.

Size of Heater	For Size Tank	Diam. of Coil	Height	Diam.	Net Weight	Weight Crated
No. 25 Black Japan Finish	30-40	Inches $\frac{3}{4}$	Inches $22\frac{7}{8}$	Inches 7	Lbs. 35	Lbs. 45
No. 25 Gray Porcelain Enamel Finish	30-40	$\frac{3}{4}$	$22\frac{7}{8}$	7	38	47
No. 35	40-60	$\frac{3}{4}$ - $\frac{7}{8}$	$25\frac{7}{8}$	$9\frac{5}{8}$	71	95

NOTE—The No. 35 is equipped with Triple Coil.

Outstanding Features in a Ruud Tank Heater

1. Full length heavy seamless copper tubing.
2. Two independent removable coils.
3. Coils joined in brass manifolds.
4. No brazed joints.
5. No stoppage from spelter runs.
6. No weakened burned tube.
7. Coils wound with reverse grade.
8. Better circulation.
9. Quicker heating.
10. Reversible union, ground joint couplings.
11. Two unions saved in the water line.
12. Inlet and outlet being centered, heater swings on an axis.
13. Quick-acting burner.
14. Fifty to sixty-five feet per hour.
15. Elevated radial ridges on burner.
16. Every hole placed correctly and evenly drilled.
17. Perfect secondary air supply.
18. Burner engaged on machined end of mixer always level.
19. No cotter pins; no set screws.
20. Burner easily removed for cleaning or inspection.
21. Offset hinges; gravity latch.
22. Supplied with needle adjustment or straight-on gas cock with lock-nut shutter.
23. Superior design and finish.
24. RUUD standard workmanship and material.
25. Saving at both ends; installation and maintenance.



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